O2Security™

Breathing Life into Security

SifoWorks D-Series 3.04 Firewall

User Manual

NOTICE

No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without receiving written permission from O_2Security.

O_2Security and its subsidiaries reserve the right to make changes to their documents and/or products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

O_2Security warrants performance of its products to the specifications applicable at the time of sale in accordance with O_2Security's standard warranty. Testing and other quality control techniques are utilized to the extent O_2Security deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customer acknowledges that O_2Security products are not designed, manufactured or intended for incorporation into any systems or products intended for use in connection with life support or other hazardous activities or environments in which the failure of the O_2Security products could lead to death, bodily injury, or property or environmental damage ("High Risk Activities"). O_2Security hereby disclaims all warranties, and O_2Security will have no liability to Customer or any third party, relating to the use of O_2Security products in connection with any High Risk Activities.

Any support, assistance, recommendation or information (collectively, "Support") that O_2Security may provide to you (including, without limitation, regarding the design, development or debugging of your circuit board or other application) is provided "AS IS." O_2Security does not make, and hereby disclaims, any warranties regarding any such Support, including, without limitation, any warranties of merchantability or fitness for a particular purpose, and any warranty that such Support will be accurate or error free or that your circuit board or other application will be operational or functional. O_2Security will have no liability to you under any legal theory in connection with your use of or reliance on such Support.

Information in this document is subject to change without notice.

©2008 O_2Security Ltd. All rights reserved. O_2Security is a subsidiary of O_2Micro International Ltd. (NASDAQ: OIIM, SEHK: 0457). O_2Security is a trademark and SifoWorks is a registered trademark of O_2Micro International Ltd.

Table of Contents

1 Product Overview 1

1.1 What is SifoWorks? 2

1.2 SifoWorks'Hardware Specifications 2

1.3 What can SifoWorks Do? 5

1.4 System Specifications 13

2 Getting started 15

2.1 SifoWorks Deployment Topology 16

2.2 Basic System Operations 19

2.3 SifoWorks User Interface 23

2.4 Task List 33

2.5 Device Quick Configuration Guide 38

3 Network Configuration 41

3.1 Overview 43

3.2 Setting up the Basic Network Settings 43

3.3 Configuring Network Address Translation 59

3.4 Setting up DHCP Service 69

3.5 Configuring PPPoE Connections 73

3.6 Specifying DNS Servers 76

3.7 Configuring DDNS 76

3.8 Managing IP-MAC Bindings 78

3.9 Managing the ARP Tables 82

4 Firewall Rule Management 85

4.1 Overview 86

4.2 Managing Filter Rules 87

4.3 Managing Local Rules 99

4.4 Managing Content Filtering Rules 101

5 Intrusion Detection and Prevention 109

5.1 Overview 110

5.2 Configuring and Enabling IDP 110

5.3 Upgrade IDP Rules 116

6 Virtual Private Networks 117

6.1 Overview 118

6.2 Configuring IPsec VPN Connections 120

6.3 Configuring PPTP VPN Connections 141

6.4 Configuring L2TP VPN Connections 144

7 Advanced Functions 147
7.1 Overview 148
7.2 Setting Up QoS Services 148
7.3 Limiting IP Traffic 152
7.4 Activating High Availability 157
7.5 Configuring IDS Services 163
7.6 Upgrade Intelligent Recognized Protocols (IRP) 174
8 Log Management 175
8.1 Overview 176
8.2 Managing Log Servers 178
8.3 Configuring Log Attributes 179
8.4 Exporting Log 179
8.5 Customizing Log Filter Criteria and Log Format 180
8.6 Setting up Email Alerts 181
8.7 Viewing Logs 182
9 System Settings 183
9.1 Overview 184
9.2 Managing Administrator Accounts 184
9.3 Setting Up Basic System Configuration 189
9.4 Import/Export Configuration File 191
9.5 Upgrade System Software 192
9.6 Connect to a Network Management System 193
9.7 Configuring Timeout Values 200
10 System Maintenance 203
10.1 Overview 204
10.2 Monitoring Sessions and Online Users 204
10.3 Viewing Reports 206
10.4 Performing Network Diagnostics 212
10.5 Restoring System Settings 214
11 Device Deployment Example 217
11.1 Network Topology and Company Requirements 218
11.2 Configuration Flowchart 222
11.3 Phase 1 – Configuring the Basic Network Settings 223
11.4 Phase 2 – Configuring NAT 227
11.5 Phase 3 – Defining Filter Rules 229
11.6 Phase 4 – Configuring VPN 243
11.7 Phase 5 – Setting up IDS 249

Chapter

1

Product Overview

This chapter includes the following sections:

- What is SifoWorks?

  Briefly introduces the SifoWorks firewall device and lists the various device models in the product series.

- What does SifoWorks Look Like?

  Displays the physical SifoWorks device box. This section also introduces the various device ports and the LED indicator lights.

- What can SifoWorks Do?

  Introduces the main functions of the SifoWorks firewall.

- System Specifications

  Contains information on the various SifoWorks devices' performance and capacity indexes, device dimensions, power supply requirements, operating environment and reliability factor.

For an overall understanding of the SifoWorks firewall, please refer to this chapter.

1.1 What is SifoWorks?

O2Security's new generation firewall product, SifoWorks, is a multi-functional security gateway system equipped with the best data packet handling capability in the industry. SifoWorks also supports various other security mechanisms such as firewall, IPsec VPN, content filtering etc., providing security on higher network levels, and thus enhancing the overall security of user's networks.

The SifoWorks D-series family includes the following device models:

- SifoWorks D100
- SifoWorks D200
- SifoWorks D300

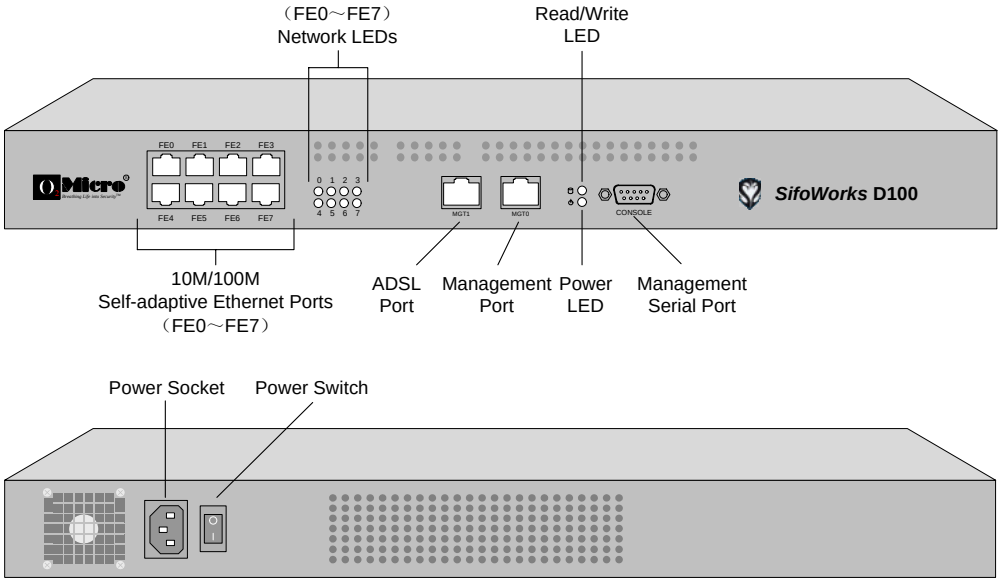
The term "SifoWorks" is used in this document to refer to all the above models.

1.2 SifoWorks' Hardware Specifications

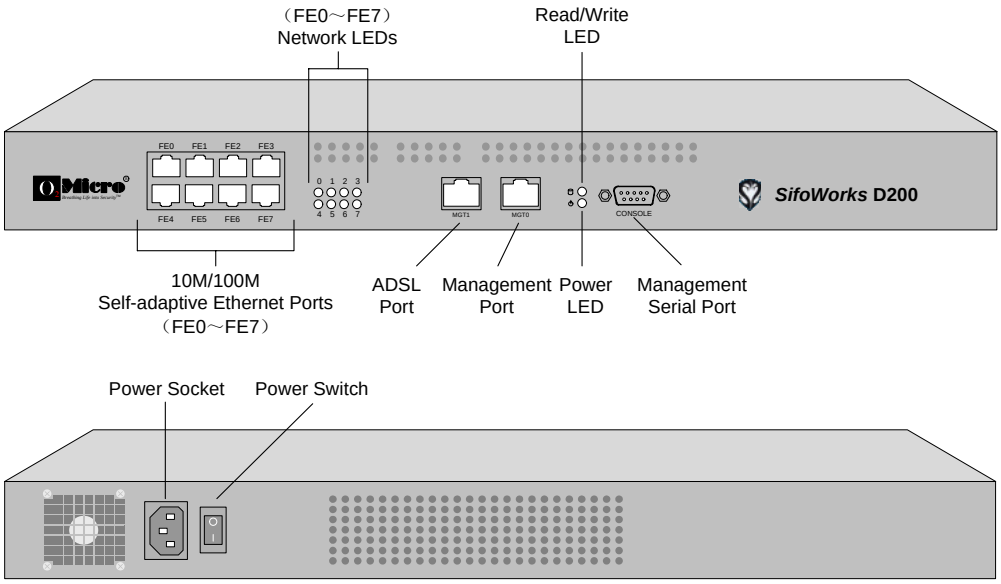
1.2.1 Device Box

The figures below show the physical device of each SifoWorks models.

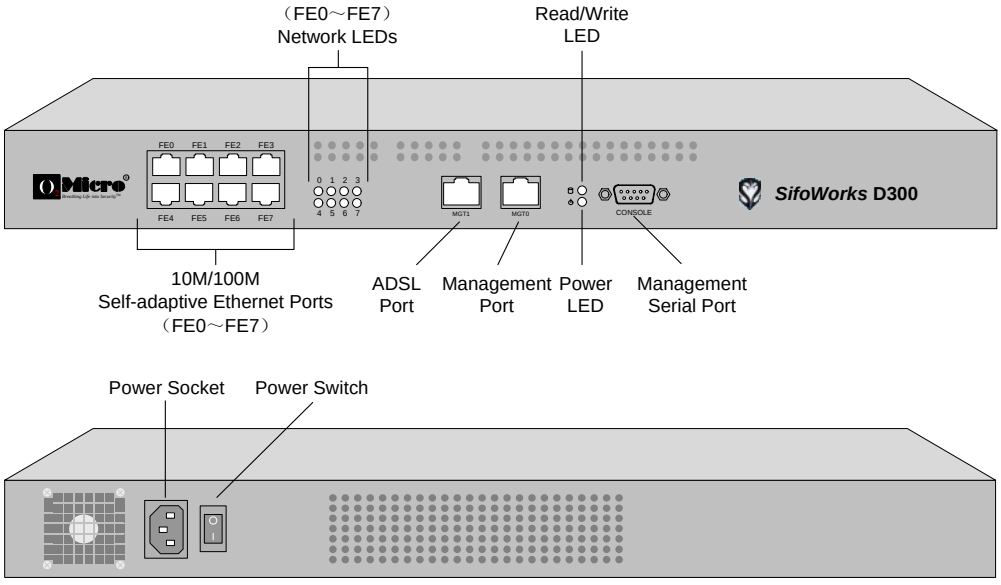
SifoWorks D100



SifoWorks D200



SifoWorks D300



1.2.2 Device Ports

Name	Explanation	Type
FE0 – FE7	10M/100M self-adaptive Ethernet ports For connection to networks with 10M/100M speed to monitor and filter data packets	RJ-45
MGT1	Used for ADSL connections. The device can be connected to the Internet using PPPoE via a ADSL modem	RJ-45
MGT0	To connect to an administrative PC via a standard network cable for system configuration Monitor ports are also used as the heartbeat monitoring port under HA mode	RJ-45
CONSOLE	RS232 serial port. A serial cable is used to connect this port to an administrative PC. The system can then be configured using a hyper-terminal program. Please configure as follows when establishing a connection via hyper terminal: **Bits per second**: 9600 **Data bits:** 8 **Parity:** None **Stop bits:** 1	DB-9

1.2.3 Device LED

Name	Status	Explanation
Power LED	On	Device is receiving power from the source normally
	Off	Device is off or not receiving power from the source normally
Read/Write LED	Flickering	Device is currently performing read/write operations
	Off	Device is not performing any read/write operations
Network Port LED	On	Corresponding network port (FE0 – FE7) is connected to a network
	Flickering	Data is being transmitted via the corresponding network port (FE0 – FE7)
	Off	Corresponding network port (FE0 – FE7) is not connected to a network

1.3 What can SifoWorks Do?

The main functions provided by SifoWorks are listed in the table below. Each function is described in detail in the following sections.

Function	Description
Status based access control	Status-based access control realized via the security chip embedded within SifoWorks.
Dynamic port analysis	SifoWorks uses a Helper module on the application layer to perform dynamic port analysis. The module supports various application layer protocols including RTSP, H.323, FTP, PPTP etc.
Internal address masking capability via NAT and PAT	Using NAT and PAT techniques, SifoWorks is able to mask internal network structure and addresses. Users can define SNAT, DNAT and double NAT rules. SifoWorks selects the port using an optimization algorithm, raising the utilization of ports and IP addresses.

Function	Description
Intelligent Protocol Recognition	Intelligent protocol recognition effectively identifies and controls applications that attempt to communicate with the network via a non-standard port. For example, the function can prevent services using a protocol other than HTTP from connecting to the network over port 80, controlling downloads using P2P clients or IM messaging etc.
DOS/DDOS defense	SifoWorks defends the network against DOS/DDOS attacks by: • Using the SYN cookie mechanism to perform authentication for TCP-based applications • For applications based on other protocols, SifoWorks uses a mechanism based on the source IP address
Content filter	SifoWorks supports the filtering of data on the application layer for the HTTP, email and FTP protocols
Rich routing capabilities	SifoWorks provides rich routing capabilities including: • 3rd layer route forwarding • Support for multi-gateway routing • Ensuring the continuity of data packets using route mirroring technology
High performance VPN engine	SifoWorks provides a high performance VPN engine, supporting IPsec VPN, PPTP and L2TP
Multi-gateway access and load balancing	SifoWorks provides a multi-gateway access function along with load balancing for connections and servers. The system establishes an independent tunnel for IPsec VPN, providing security and redundancy for connections between branch networks without compromising the firewall's performance. This ensures that information can be transmitted securely within the company.
Comprehensive, multi-level flow control	SifoWorks helps to achieve comprehensive flow control by combining SifoWorks' IP rate limit function together with IRP (Intelligent Recognized Protocols) and QoS.
High Availability (HA)	SifoWorks supports the high availability (HA) mode: AS (Active-Standby)

1.3.1 Status-based Access Control

Status based access control over packet transmission within a network is the firewall's basic functionality. This is achieved using a high density security chip embedded within SifoWorks. When SifoWorks receives a packet, it first checks if there is any session information corresponding to this packet. The system then decides whether to forward this packet directly or continuing matching it against the security rules based on the result of this check.

Session establishment for TCP transmission requires a three-way handshake. A similar mechanism is used for other protocols such as UDP and ICMP. Status based control over sessions reduces network attacks and enables SifoWorks to dynamically allow related connections to pass through the system.

1.3.2 Dynamic Interface Analysis

Certain protocols establish multiple independent data links. For example, the FTP protocol establishes separate data tunnels and command tunnels. First, a command tunnel is established. When users send a file request command via this tunnel, the FTP server and client negotiate the data tunnel's attributes, including source and destination interfaces, via the command tunnel. A data tunnel will then be established between server and client. Since the source and destination interfaces are dynamically assigned, the firewall cannot be pre-configured to accept such connections. Furthermore, the firewall must also be able to accept all related connections.

SifoWorks' Helper module effectively identifies the attributes of related connections and notifies the security chip to establish a sub data link. Packets received by SifoWorks through the data tunnel will thus be accepted. The Helper module also performs NAT on the packet's payload.

SifoWorks' Helper module includes support for various application layer protocols such as RTSP, H.323, FTP, PPTP etc.

1.3.3 Internal Address Masking Capability Based on NAT and PAT

For most enterprises, the number of public IP addresses allocated is far less than the number required to assign an IP to each internal PC. Also, enterprises want to mask their internal IP addresses to avoid exposing their internal network structure to attacks by hackers. SifoWorks resolve the above 2 issues using the NAT and PAT technologies.

SifoWorks allows users to define SNAT, DNAT and Double NAT rules, using an optimization algorithm to enhance the utilization of ports and IP addresses.

1.3.4 Intelligent Protocol Recognition

There are standardized ports for application layer services such as port 80 for HTTP, port 21 for FTP etc. For enterprises wishing to restrict their employees from accessing the Internet, the simplest method would be to close port 80, thus denying HTTP packets. However, new developments now enable users to customize the port number used for HTTP applications. Furthermore, several P2P software dynamically determines which port number to use. Thus, allowing and denying the transmission of specific data through the firewall is now no longer a simple issue. SifoWorks thus introduces an intelligent protocol recognition function.

Intelligent protocol recognition effectively identifies and controls services transmitting data over a non-standard port, such as replacing port 80 with port 90 for HTTP. This enforces effective control over the use of such services. For example, preventing the transmission of packets sent via port 80 but are not using the HTTP protocol effectively restricts services from using port 80 such as P2P downloads and IM messaging. Using a port/protocol system, the intelligent protocol recognition function is able to identify and block illegal data flow.

This function supports a wide number of protocols including:

- HTTP, FTP, SOCKS, SSH, Telnet
- TFTP, VNC, RTSP, H.323, SIP, IM_HTTP_Proxy
- SMTP, POP3, IMAP
- AIM, MSNMessenger, QQ, YahooMessenger, Popo
- Bittorrent, Edonkey, MUTE, FOXY, Kugoo, Xunlei

1.3.5 DoS/DDoS Defense

DOS/DDOS attacks are a common threat faced by network security systems. Using viruses, trojans or malwares, hackers can manipulate machines to initiate such attacks by simply sending a command. Network usage will be disrupted if the firewall is unable to differentiate between such machines and legal users when a DOS/DDOS attack occurs.

SifoWorks provides the following DOS/DDOS defense mechanisms:

- TCP protocol

  SifoWorks uses a SYN cookie mechanism to perform authentication. A packet is identified as a legal data flow if it is successfully authenticated via this mechanism. The system will then check the packet against sessions or rules. Otherwise, the packet is identified as an illegal data flow and dropped.

- UDP and other protocols

  SifoWorks uses an overall record mechanism based on source IP. Each record includes the connection speed, total connection number, traffic etc. SifoWorks allows for more than 1M of source IP records.

  For example, 2 web servers, providing HTTP services of up to 200M each are set up in the network. When a hacker initiates a DOS/DDOS attack on the server, the large amount of fake IP rapidly takes up the server's bandwidth, thus denying other accesses to the servers. When SifoWorks' DOS/DDOS defense is deployed, the system restricts all connections from the fake IPs, thus ensuring that the server has sufficient bandwidth to provide services to legal users.

With the two mechanisms above, SifoWorks greatly reduces the threat of DOS/DDOS attacks.

SifoWorks is able to detect and protect your network against the following types of attacks:

- SYN Flood
- TCP scan
- Ping Sweep
- Ping Flood
- UDP Flood
- UDP scan
- ARP Attack
- TearDrop
- Bonk
- Boink
- Nestea
- Newtear
- Syndrop
- Jolt2
- Oshare
- 1234
- Ping of death
- Saihyousen
- Smurf Attack
- Land-based Attack
- WinNuke

1.3.6 Content Filter

Traditional firewalls support access control on the TCP/IP layer but not on application layer data. Packets with legitimate TCP and IP information but containing illegitimate data will still be allowed to pass through the network.

Therefore, other than control over packets on the TCP/IP layer, enterprises also wish to filter packets based on application data. SifoWorks supports application layer content filtering for the following protocols:

- HTTP

  SifoWorks supports filtering of HTTP content based on URL, commands, and keywords; is able to restrict multi-thread downloading and supports removal of scripts such as Active-X, Javascripts, Java applet and cookie.

- Email

  SifoWorks supports email content filtering based on SMTP server, recipient mail addresses, sender mail addresses, email subject, mail body keywords, mail attachment, mail size and the number of recipients.

- FTP

  SifoWorks supports the filtering of FTP data based on file name, keywords and commands. Multi-thread downloading of FTP files can also be denied.

1.3.7 Routing Capability

SifoWorks is also equipped with rich routing capabilities including:

- Strong forwarding functionality at the 3rd network layer

  SifoWorks' route module supports up to 512 static routes and 247 policy routes. Policy routing can not only determine the outgoing interface using the destination IP, but can also determine the next hop address using the source IP and port number.

  For example, an enterprise has 2 outgoing WAN interfaces (ADSL and optic fiber). The enterprise's research department relies heavily on the Internet service. IT personnel can thus configure SifoWorks such that the accesses to the Internet from the research department are routed to the optic fiber interface while accesses by other departments are routed to ADSL. SifoWorks determines which interface to route accesses to using the source IP, even if the destination URL (destination IP) is identical.

- Multi-Gateway Routing

  Multiple gateway addresses can be configured for a single route. The system selects the next hop gateway address based on a priority system, thus achieving load balancing.

  The system must be able to dynamically monitor the status of each gateway. When a particular gateway fails, SifoWorks promptly modifies route configurations, directing all traffic from the failed gateway to other gateways.

- Ensuring packet continuity

  Packets belonging to the same connection should be transmitted via the same route to ensure continuity.

  SifoWorks not only ensures that packets from the same connection are transmitted via the same gateway but also uses route mirroring to ensure continuity for connections from an external source. That is, all packets of a connection entering SifoWorks from gateway A will be transmitted from the same gateway.

1.3.8 High Performance VPN Engine

SifoWorks' high performance VPN engine supports IPsec VPN, PPTP VPN and L2TP VPN.

The system supports the DES, 3DES and AES encryption algorithms, MD5 and SHA1 authentication algorithms. The DES and AES modules are equipped with up to 200Mbps processing capability.

IPsec VPN also supports AH, ESP and AH+ESP modes.

1.3.9 Multi-Gateway Access and Load Balancing

Using its routing function (“1.3.7 Routing Capability”), SifoWorks is able to support multi-gateway access. This in turn equips SifoWorks with the capability of achieving load balancing between multiple connections and servers.

As the system establishes independent tunnels for IPsec VPN, it provides security and redundancy for connections between the company’s branch networks without compromising the firewall’s performance. This ensures that information can be transmitted securely within the company.

SifoWorks is also able to balance traffic load among multiple servers via DNAT (Destination Network Address Translation) rules. For example, multiple Web servers are set up to provide services externally at the same time. Using a round-robin or priority weight system, SifoWorks can distribute traffic among these servers. A “Sticky” option is also available in SifoWorks, ensuring that requests from the same host are processed by the same server.

- Round-robin

  External connection requests will be assigned to the servers in a round-robin manner. If “Sticky” is enabled, the system will establish a relationship between source and destination addresses using the hash algorithm. The connection is then assigned to the next available server.

- Priority weight

  All servers are assigned with a priority weight value. External connection requests are then distributed to the servers according to their priority. Servers with larger priority weight will be assigned with a larger number of requests.

1.3.10 Comprehensive Flow Control

SifoWorks IP rate limit can operate in conjunction with the IRP (Intelligent Recognized Protocols) and QoS functions, providing a well-rounded flow control comprising of 3 layers:

- Enable IRP and QoS functions in filter rules to achieve overall flow control based on protocols.
- In the IP rate limit function, define a “Subnet” type limit. This achieves a 2nd level of flow control for entire subnets.
- In the IP rate limit function, define “Host” type limits to achieve flow control over individual hosts.

1.3.11 High Availability (HA)

SifoWorks includes a HA function to ensure network reliability supporting the HA-AS (Active Standby) mode.

In AS mode, configuration information such as rules, objects, routes and sessions will be synchronized on both master and slave device. When the master device fails, all network services will be automatically re-directed to the slave device.

1.4 System Specifications

1.4.1 Device Performance and Capacity

The following table lists the various performance and capacity indexes of the SifoWorks device.

Index	Value
Firewall Performance	• D100 – 200Mbps • D200 – 450Mbps • D300 – 600Mbps
VPN Performance	• D100 – 150Mbps • D200/D300 – 200Mbps
Number of Concurrent Sessions	1,200,000
Session Establishment Rate per Second	6,000
Number of Security Policies	• D100 – 4000 • D200/D300 – 8000
Number of Customizable Security Domains	8
Packet Latency	5µs – 13µs

1.4.2 Device Dimensions

The following table details the physical dimensions of the SifoWorks device.

Index	Value
Length x Breadth x Height	428mm x 358mm x 47mm
Weight	5kg

1.4.3 Power

The following table lists the power supply requirements of the SifoWorks device.

Index	Value
Voltage	90V – 260V
Frequency	50Hz – 60Hz

1.4.4 Operating Environment

The physical operating environment requirements of the SifoWorks device are detailed in the table below.

Index	Value
Operational Temperature	0ºC – 40ºC
Non-operational Temperature	-10ºC – 70ºC
Humidity	10% – 90%

1.4.5 Reliability Index

The following table shows the reliability index of the SifoWorks devices.

Index	Value
MBTF (Mean Time Between Failure)	100,000h

Chapter

2

Getting started

This chapter comprises of the following sections:

- SifoWorks Deployment Topology

  Explains the three commonly used deployment modes of SifoWorks

- Basic System Operations

  Describes the basic SifoWorks operations including system login and logout. This section also describes the procedure to add, edit and delete records where a record refers to an object, administrator account, filter rule etc. that is stored and displayed using lists on the system.

- SifoWorks User Interface

  Describes the SifoWorks UI (user interface) and the various system menu options

- Task List

  Lists the various tasks a SifoWorks administrator may need to perform when managing the system and network activities.

- Device Quick Configuration Guide

  Displays a flowchart and brief explanation on how to deploy and configure your SifoWorks device to provide basic functionality in your existing network.

2.1 SifoWorks Deployment Topology

By selecting different work mode for the SifoWorks system, you can deploy SifoWorks using one of three modes: Transparent mode, route mode and hybrid mode. Each of these modes is explained in detail below.

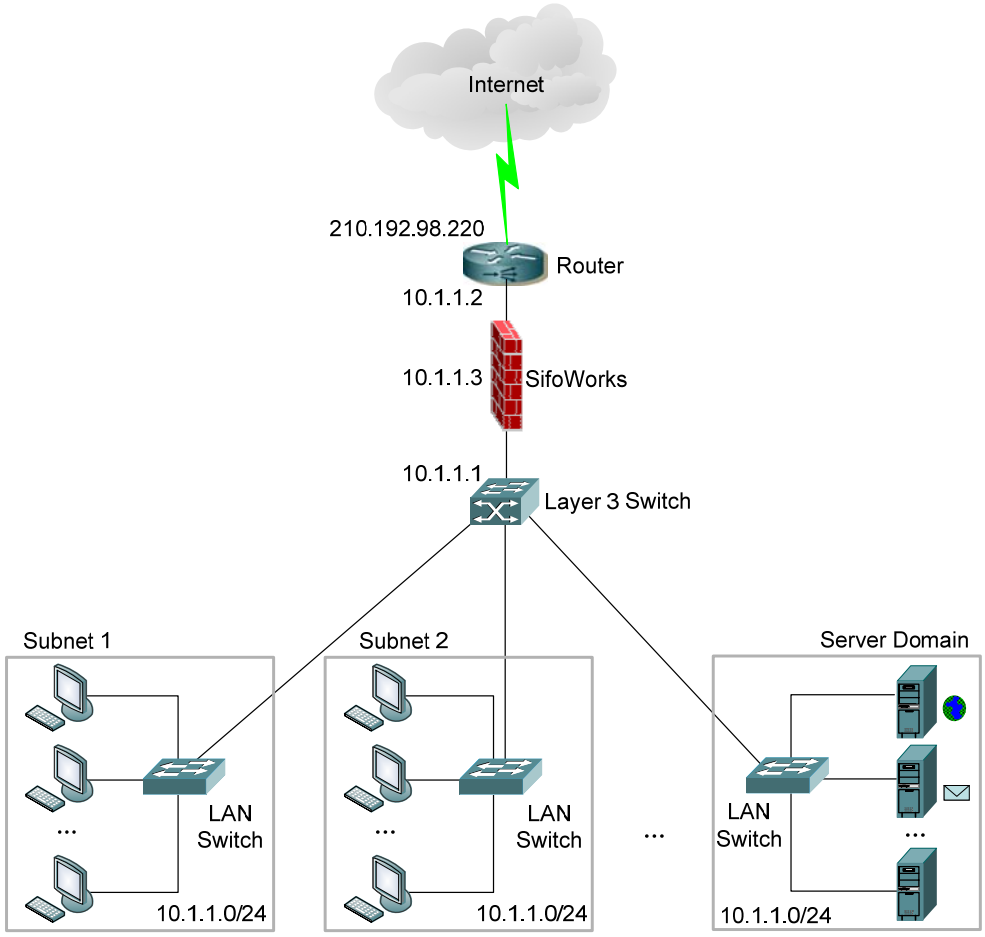
Note:

Please refer to "3 Network Configuration" for information on setting up SifoWorks working mode and other network parameters.

2.1.1 Transparent Mode

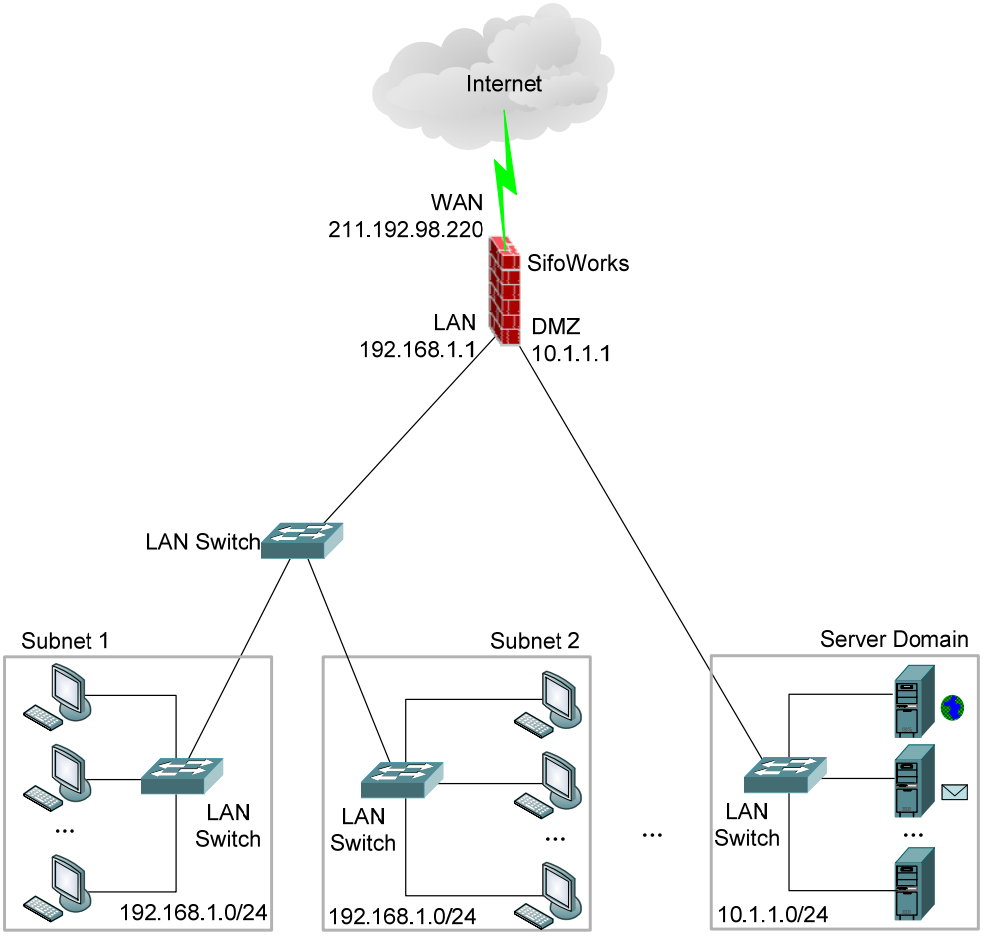
Transparent mode is suitable for networks that do not require routing or NAT address translations. All devices directly connected to SifoWorks are located within the same network domain. An example would be deploying SifoWorks between a router and a layer 3 switch. In this mode, no modifications to the existing network settings are necessary. NAT or routing via SifoWorks is not required for local network devices.

An example of a network topology deploying SifoWorks in transparent mode is shown below.



2.1.2 Route Mode

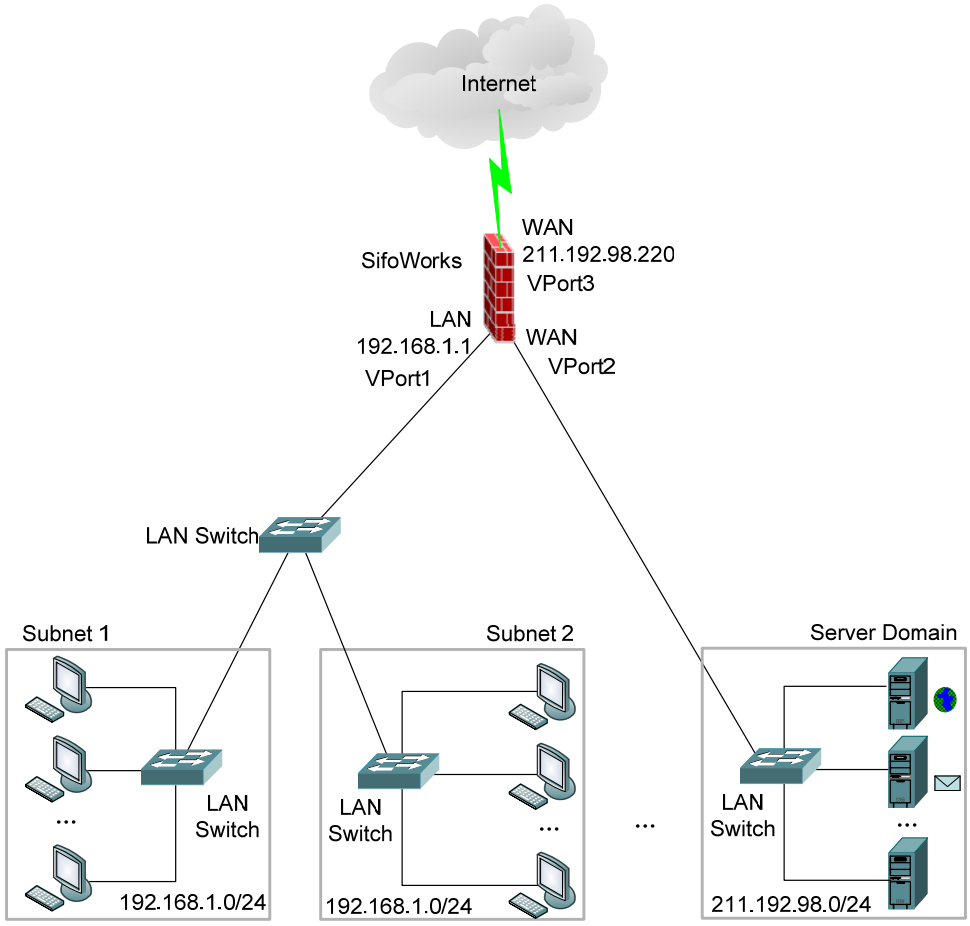
Route mode is suitable for networks that are made up of multiple domains, with each domain using a different network segment. All data transmitted between devices in different domains must pass through SifoWorks for routing or NAT. The figure below shows an example of a network topology deploying SifoWorks in route mode.



2.1.3 Hybrid Mode

Hybrid mode is suitable in networks that are made up of 2 or more network domains, where some domains are from different network segments. Data transmission between domains in different network segments is handled in the same way as in route mode. The handling mechanism for data transmission for domains within the same network segment is identical to that for transparent mode.

An example network topology with SifoWorks deployed in hybrid mode is shown below:



2.2 Basic System Operations

2.2.1 System Login

After deploying SifoWorks in your network, SifoWorks administrators can login to the system's UI via the Internet Explorer browser (version 6.0 or later) or the Mozilla Firefox browser (version 1.5 or later).

SifoWorks supports 2 login methods:

- Traditional Login

  Logging into the system via user name and password

- OTP (One Time Password) Login

  Uses a one time password to login to the system. The system computes a response string based on password and a dynamically generated challenge string. User password will not be transmitted over the network, thus ensuring user security.

📖 Note:

OTP login can only be used by users whose account is configured with the "allow OTP login" attribute and JRE (version 1.6.0 or later) is installed on the host used to access SifoWorks.

You can request for a login administrator account from the system's default administrator (using the "admin" account). Whether your account is allowed to login via OTP depends on your account settings added by the default administrator.

Users can login to SifoWorks only if it is within their account's validity period.

CONFIGURATION PROCEDURE – TRADITIONAL LOGIN

Step 1 Activate your web browser on the administrative PC.

Your administrative PC must be able to access the network where SifoWorks is deployed in. If your PC is directly connected to SifoWorks via a cross-over cable, please ensure that your PC's IP address is within the same subnet as the IP address of SifoWorks' administrative interface.

Step 2 In the address bar, enter SifoWorks' administrative IP address.

If this is the initial login to the system via the management port, please enter the factory default address "https://172.16.0.1" in your web browser. For information on modifying SifoWorks' administrative IP address, please refer to "3.2 Setting up the Basic Network Settings".

Step 3 A login dialog window will appear. Enter your user name and password in the respective textboxes.

Step 4 Click **[Login]** to login to the system.

CONFIGURATION PROCEDURE – OTP LOGIN

Step 1 Activate your web browser on the administrative PC.

Your administrative PC must be able to access the network where SifoWorks is deployed in. If your PC is directly connected to SifoWorks via a cross-over cable, please ensure that your PC's IP address is within the same subnet as the IP address of SifoWorks' administrative interface.

Step 2 In the address bar, enter SifoWorks' administrative IP address.

If this is the initial login to the system via the management port, please enter the factory default address "https://172.16.0.1" in your web browser. For information on modifying SifoWorks' administrative IP address, please refer to "3.2 Setting up the Basic Network Settings".

Step 3 A login dialog window will appear. Enter your user name and select "OTP User".

Step 4 A challenge string will be generated and displayed. Copy the string of characters between "otp-md5" and "ext" into the **Challenge** textbox below. For example, the challenge value is "498 lo1" in the figure below.

Step 5 Enter your account **Password**.

Step 6 Click **[compute with MD5]**. The system will generate a string of characters in the **One-Time Password** textbox below.

Step 7 Copy the one-time password generated into the **Response** textbox above. Click **[Login]** to login to SifoWorks

2.2.2 System Logout

From the administrative interface, select “Logout” from the left or click from the top right corner of the page.

2.2.3 Add Record

This section explains how to add a record, such as an administrator account, an address object, a service object or a filter rule etc. into the system.

Note:

This section gives an overall explanation to the procedure to add a record entry into the system. For detailed information on the various kinds of records that can be added, please refer to the appropriate sections later in this manual. For example, you can refer to “9.2 Managing Administrator Accounts” for information on user account records or “4.2 Managing Filter Rules” for details on filter rule records.

CONFIGURATION PROCEDURE

Step 1 Navigate to the configuration page for the particular type of record from the left menu bar.

Step 2 Click **[Add** *XX***]**, (*XX* depends on the type of record you are adding).

Step 3 In the “Add *XX*” interface displayed, configure the settings accordingly.

Step 4 Click **[Save]**. The system will add a new record to the corresponding list.

2.2.4 Edit Record

This section explains how to edit an existing record.

Note:

This section gives an overall explanation to the procedure to modify a record entry in the system. For detailed information on the various kinds of records, please refer to the appropriate sections later in this manual. For example, you can refer to "9.2 Managing Administrator Accounts" for information on user account records or "4.2 Managing Filter Rules" for details on filter rule records.

CONFIGURATION PROCEDURE

Step 1 Navigate to the configuration page for the particular type of record from the left menu bar.

Step 2 From the record list, click the icon in the row corresponding to the record to be modified.

Step 3 From the configuration interface displayed, modify the settings as required.

Step 4 Click **[Save]** to save the changes. A success message should be displayed by the system.

2.2.5 Delete Records

This section explains how to delete a system record.

Note:

This section gives an overall explanation to the procedure to delete a record entry from the system. For detailed information on the various kinds of records, please refer to the appropriate sections later in this manual. For example, you can refer to "9.2 Managing Administrator Accounts" for information on user account records or "4.2 Managing Filter Rules" for details on filter rule records.

CONFIGURATION PROCEDURE

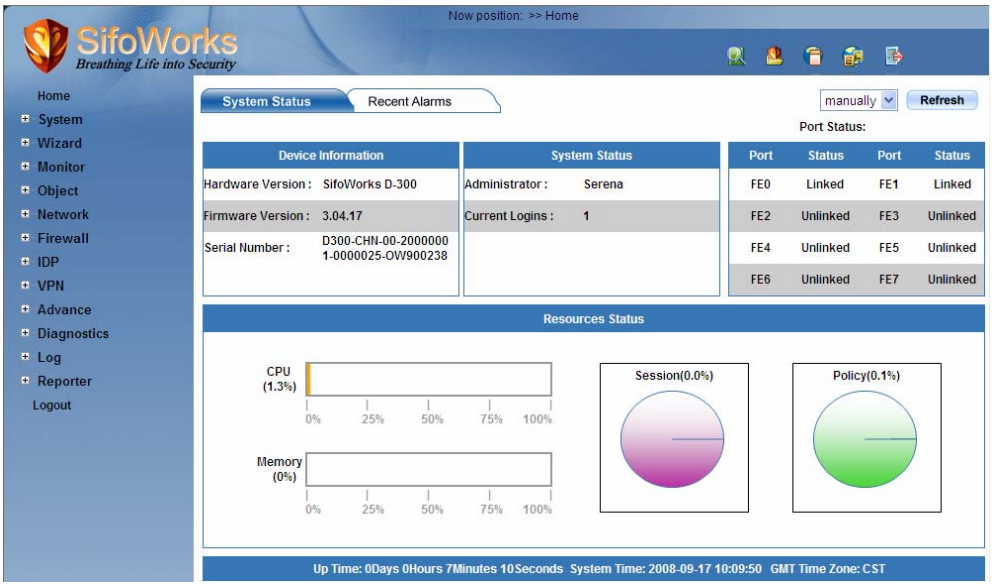
Step 1 Navigate to the configuration page for the particular type of record from the left menu bar.

Step 2 From the record list, click the icon in the row corresponding to the record to be deleted.

Step 3 From the confirmation popup window, click **[OK]** to delete the record and refresh the list.

2.3 SifoWorks User Interface

Upon successful login, the SifoWorks administrative UI will be displayed.



SifoWorks' web UI includes 3 areas:

- Toolbar

  The toolbar is located at the top right corner of the interface and includes several buttons:

  – : Opens a new window displaying the system's online help

  – : Opens a new window loading O2Security's home page (http://www.o2security.com)

  – : Opens a new window loading the authentication website (http://www.us-cert.gov/)

  – : Navigate to the "System Configuration" interface to select the UI's display language

  – : Logout of the SifoWorks system

- Menu Bar

  The leftmost column of this interface is the menu bar. You can navigate to the configuration/monitoring interfaces of the various system functions by selecting the corresponding menu options. The tables later in this section briefly explain each option.

- Operation Window

  The right frame of the web UI is the operation window where you can configure the system, monitor network activities etc. Detailed information regarding the various system functions can be found in the later chapters of this manual.

The Menu Options

Menu: Home	
-	Displays various system status information and recent alerts. You can select to manually refresh the displayed information or set up the system to automatically refresh the display periodically.

Menu: System	
Admin Setting	To management the user accounts that can login to SifoWorks UI. This includes adding/deleting accounts, managing account access authority, managing login security attributes etc.
Config File	To import or export system configuration file.
Patch Setting	To upgrade SifoWorks' software version.
Common Setting	To configure the system's basic settings such as web timeout, UI language, system date and time, web server CA etc. This interface also allows you to reboot your device or reset the device's settings to factory default.
SNMP Setting	If you want to manage SifoWorks using a network management system, you must use this interface to complete the SNMP proxy configuration. "SNMP Trap" and "Auth Server" are optional configurations.
SNMP Trap	Set up SNMP Trap so that SifoWorks alerts the specified server if abnormalities in the device status are detected.
Timeout Setting	Specify timeout values for various SifoWorks operations including timeout for ICMP, TCP, UDP connections etc.
Registration Server	Specify the server where a network management system will automatically discover this device for management. You must first enable and configure "SNMP Setting" for this function to operate properly.

Auth Server	To configure external authentication servers, customize the authentication interface and related security settings. Other than the default local authentication method, SifoWorks also supports the use of RADIUS, LDAP and AD authentication servers to authenticate users.
Auth Address	Manage the address range of authentication users and the authentication server associated to each range. A user will only be authenticated by the authentication server if his IP address is within the associated address range.
Auth User	Manage the list of authentication users. You can define three types of authentication users: filter rule, L2TP and PPTP.
Auth Group	To manage authentication users using groups.

Menu: Wizard	
VPN Wizard	A step-by-step wizard to set up a basic point-to-point IPsec VPN connection.
Filter Rule Wizard	A step-by-step wizard to add a filter rule.

Menu: Monitor	
Session	To view session information including source IP, destination IP, protocol, established time etc. for each session. You can also manually terminate selected sessions from this interface.
Online User	To view all currently online users who have been successfully authenticated. The information displayed includes user name, source IP, online time, and authentication server. You can also manually disconnect users from this list.
DHCP Lease	To view all IP addresses assigned to client ends by DHCP servers, the corresponding MAC addresses, starting and ending time of the lease etc. DHCP servers refer to the DHCP servers specified on SifoWorks' network configuration interface.

Menu: Object	
Address	Add/edit/delete an IP address or IP address range object to facilitate the creation of filter rules or VPN connections.
Address Group	Add/edit/delete a group of IP address or IP address range object to be used when defining filter rules or VPN connections.
Service	Add/edit/delete TCP, UDP or ICMP type service objects to be used when defining filter rules. By default, the system defines several hundred commonly used services. You can add new services customized to your network requirements.
Service Group	Manage service group objects to be used when defining filter rules.
MapList	To add a table object made up of a series of address mappings. This facilitates the formulation of source NAT rules. Each map table can contain multiple address mappings. Hence, using map tables help to reduce the number of NAT rules. This optimizes the system's NAT performance.
Server Load Balance	These objects are applied on destination NAT (DNAT) rules to achieve load balancing between multiple servers via DNAT.
Schedule	To add a recurring or one-time schedule to be used when defining weekly schedule objects or to be used in filter rules directly to control the time period during which the rule is valid. For example, you can add a schedule to only enable a filter rule from 1-3pm daily.
Weekly Schedule	To add/edit/delete weekly schedule objects. These objects can be used when defining filter rules to control the time rules are valid. For example, you can set up a rule to be valid only between 1pm-3pm every Monday. You must use schedule objects when defining weekly schedule objects.
IP Pool	To manage IP pool objects, each containing a range of IP addresses. IP pool objects are used to facilitate the configuration of VPN connections (specifies the range of IP addresses that can be assigned to the VPN clients).
Content Filtering Obj	To manage URL, email or keyword objects used in defining content filtering rules.

Menu: Network	
Virtual Port Config	To group SifoWorks' data ports into three virtual ports.
VLAN Setting	To add and configure VLANs according to your network topology.
IP Config	To configure the IP address for each VLAN. You can also modify the administrative IP of SifoWorks from this interface.
Route Setting	To add static and policy routes
DHCP Setting	To set up SifoWorks as a DHCP server or to specify DHCP relay servers to provide DHCP services.
PPPoE Setting	To configure SifoWorks such that it is able to establish a connection to external networks via PPPoE. Note that you must enable PPPoE mode from the **"Advance > PPPoE Mode"** interface.
IP-MAC Binding	To manage IP to MAC binding pairs. This enhances security by preventing the misuse of IP addresses by illegal hosts.
ARP Setting	To manage the system's ARP table including static ARP and dynamic ARP tables. This reduces security risks caused by ARP spoofing or IP spoofing. From this interface, you can manually add static ARP records or select the records from the dynamic ARP table and add them to the static ARP table.
DNS Setting	To specify the IP addresses of the DNS servers. This equips SifoWorks with domain name resolution capability.
DDNS Setting	To establish connection with DDNS (Dynamic Domain Name System) servers to provide the DDNS service. This allows users to establish dynamic VPN connections via PPPoE.

Menu: Firewall	
Filter Rule	To manage a list of filter rules customized according to your network requirements. These rules filter data transmitted through the firewall's data ports.
Local Rule	To define local rules used to control access to the SifoWorks system via data ports. These rules restrict administrative accesses to the firewall.
NAT Rule	To add source or destination NAT rules, translating source or destination addresses of specific data packets. To apply maplist objects to source NAT rules or server load balancing objects in destination NAT rules, you must create the corresponding objects from the "Object > MapList" or "Object > Server Load Balancing" interfaces first.
Content Filtering	To manage a list of content filtering rules set up according to the company requirements, filtering data on the application layer that are allowed to pass through SifoWorks.

Menu: IDP	
Network Variables	To differentiate between internal and external networks
Rule Group Control	To enable/disable all rules or a subset of rules within each IDP rule group. You can also modify the attributes of each rule.
User-Defined Rules	To define IDP rules customized according to your company's needs.
Rule Upgrade	To upgrade the set of IDP rules.
Upgrade Setting	To configure the system such that it is able to perform IDP rule upgrade operations. The system automatically downloads the upgrade file from an O2Security server. You can set up an email address before executing a rule upgrade. Any alert messages generated due to an upgrade failure can then be sent to this email address.
Preprocessors	To enable and set up the IP Defragmentation, TCP Stream Reassembly or Port Scan preprocessors.
IDP Control	To select IDP working mode.

Menu: VPN	
IPsec Setting	To enable/disable VPN and select the outgoing interface used for IPsec VPN connections. Virtual Port 2 is used as the default outgoing interface. Hence, simply select the VLAN assigned to the desired outgoing interface from the list of VLANs assigned to Virtual Port 2.
Manual Key	To manage the manual keys used to establish VPN connections. This is mainly used to test if IPsec VPN is working correctly. We do not recommend establishing VPN connections using manual key for normal operations.
IKE	To manage the list of IKE (Internet Key Exchange) used for VPN connection establishment.
VPN Connection	To manage VPN connections.
Root CA	To manage root CAs used during IKE authentication.
Local CA	To manage local CAs used during IKE authentication.
Remote CA	To manage remote CAs used during IKE authentication.
PPTP	To configure PPTP VPN connections.
L2TP	To configure L2TP VPN connections.

Menu: Advance	
QoS Setting	To define QoS priority levels for each virtual port. This can then be applied to filter rules to enable the QoS service. You can also enable/disable QoS and set up the maximum and guaranteed bandwidth for each virtual port.
IP Rate Limit	To enable the IP limit function, limiting the upload and download speeds available for an individual IP address or a subnet.
HA Setting	To enable/disable HA between two SifoWorks device. Two SifoWorks devices work in AS mode if HA is enabled.
IDS Linkage	To provide IDS by setting up the system to link SifoWorks with a third party IDS device. Currently, SifoWorks supports IDS devices from Venus and NSFOCUS.
IDS Setting	To set up SifoWorks' own IDS function.
PPPoE Mode	Select the PPPoE mode to enable SifoWorks to connect to external networks via PPPoE. After enabling PPPoE here, you must then configure the PPPoE settings accordingly from the **"Network > PPPoE Setting"** interface.
IRP Upgrading	To import an upgrade file to update the IRP (Intelligent Recognition Protocol) module. IRP recognizes which protocol is being used by a particular connection. Applying IRP on filter rules and QoS allows the system to block or limit traffic from specific protocols. However, network protocols are constantly evolving. Hence, for IRP to be effective, the system's IRP module should be regularly updated to recognize new or modified protocols. You can obtain the IRP upgrade patch from O2Security.

Menu: Diagnostics	
Ping	Executes the Ping command to check connectivity between SifoWorks and external networks.
Ping Result	To view the result of the executed Ping commands.
Trace Route	Executes the Traceroute command to check connectivity between SifoWorks and external networks.
Trace Route Result	To view the result of the executed traceroute commands.

Menu: Log	
Log Server	To configure the system's log server.
Log Global	To specify the maximum number of log entries to store for each log type. Also set up the policy for deleting log entries. From this interface, you can also select whether to record DNS log, ICMP log and log all data packets that do not match any filter rules.
Log Export	To export logs to an external FTP server.
Log Filter	This allows you to specify criteria to filter logs (for each log type) that are to be stored locally (LocalDB) or remotely (Server1 – Server4). You can also specify filter criteria to select the logs that are to be sent via email (EmailAlert) or exported to a FTP server. This allows you to select to store only the necessary logs. The system further enhances user convenience when viewing logged information by allowing you to specify the format of logs for each log type.
Email Alert	To enable and set up the log email alert function including configuring the email address to receive log files, the time interval between each mail send etc.
Admin Log	To search and view administrative logs.
System Log	To search and view system logs.
Security Log	To search and view security logs.
Traffic Log	To search and view traffic logs.

Menu: Reporter	
Reporter Setting	To enable/disable the report monitoring function and select the elements to be monitored.
System Status	To view current and history firewall status report including CPU status, content status and Ramdisk status information.
Traffic	To view current and history reports on traffic flow for each data port including each port's outgoing, incoming and total traffic flow.
IP Traffic Statistics	To view statistical reports on traffic for each IP address. These reports allow you to understand the upload speed, download speed and total traffic generated by each IP address. You can click the icon on the report to navigate to the interface where you can change the traffic limit for a particular IP address.
Session Number	To view current and history reports on the number of system session. You can also view the distribution of sessions based on protocols used.
Session Rate	To view current and history reports showing the rate of session establishment (in seconds).

Menu: Logout	
-	To logout from SifoWorks.

2.4 Task List

The table below contains a list of possible tasks an administrator may need to perform when configuring or monitoring the SifoWorks system.

Network Configuration		
Setting up the Basic Network Settings	During the installation of SifoWorks or when you need to modify network configurations.	3.2
Configuring NAT	When SifoWorks must perform NAT on the transmitted data packets.	3.3
Setting up DHCP Service	When SifoWorks is to be set up as a DHCP server or specify DHCP relay servers to provide DHCP services.	3.4
Configuring PPPoE Connections	To set up SifoWorks such that the system is able to establish PPPoE connections with external networks.	3.5
Specifying DNS Servers	To equip SifoWorks with domain name resolution capability.	3.6
Configuring DDNS	To establish connections with DDNS servers to provide DDNS service, allowing users to establish dynamic VPN connections via PPPoE.	3.7
Managing IP-MAC Bindings	To set up IP-MAC bindings in the system to ensure that users can only access the system through allowed hosts.	3.8
Managing the ARP Tables	To manage the static and dynamic ARP entries generated by SifoWorks when transmitting data packets through the networks.	3.9

Firewall Rule Management		
Managing Filter Rules	When filter rules for packets arriving at the data ports need to be added or modified.	4.2
Managing Local Rules	To set up SifoWorks such that users can access the system by connecting via a data port.	4.3
Managing Content Filtering Rules	When the system needs to filter application layer data including HTTP, FTP and Email data.	4.4

Intrusion Detection and Prevention (IDP)		
Configuring and Enabling IDP	When IDP is to be activated on SifoWorks.	5.2
Upgrade IDP rules	When the SifoWorks system's IDP is based on the Snort system and you need to update the Snort version.	5.3

VPN Configuration		
Configuring IPsec VPN Connections	When you want to configure a site-to-site VPN connection or set up an IPsec VPN connection for remote accesses.	6.2
Configuring PPTP VPN Connections	When you want to add PPTP VPN connections.	6.3
Configuring L2TP VPN Connections	When you want to configure L2TP VPN connections.	6.4

Advanced Functions		
Setting Up QoS Services	When you want to enable QoS, specifying maximum and guaranteed bandwidth to ensure quality of service for all data traffic transmitted through the firewall.	7.2
Limiting IP Traffic	To enable IP limit function such that the system restricts the upload and download speeds for specific IP addresses or subnets.	7.3
Activating High Availability	When two SifoWorks devices are to be set up in HA to ensure system reliability.	7.4
Configuring IDS Services	To activate SifoWorks' IDS function or set up to use a 3rd party IDS device.	7.5
Upgrade Intelligent Recognized Protocols	Update the intelligent recognized protocols function.	7.6

Log Management		
Managing Log Servers	When you need to configure the local and remote log servers (Server1 – Server 4) or limit the number of log records that can be generated per second.	8.2
Configuring Log Attributes	When you need to control the log display such as the log levels to be recorded, select the log levels to include in email alerts, whether to log DNS requests etc.	8.3
Exporting Logs	Set up the system to export logs to the specified FTP server.	8.4
Customizing Log Filter Criteria and Log Format	When you need to customize the filter criteria and format of logs to be stored via each storage method (localDB, remote server, email, FTP export).	8.5
Setting Up Email Alerts	To set up the system to send email alerts for specific log entries including specifying the recipient addresses and time interval between the sending of mails etc.	8.6
Viewing Logs	To query and view the admin, system, security and traffic logs.	8.7

System Settings		
Managing Administrator Accounts	You should perform this operation if you want to: 1. add, edit or delete an existing admin user account 2. set up attributes such as retry times, freeze duration for an account These operations can only be performed by the default administrator account “admin”.	9.2
Setting up Basic System Configuration	When you need to set up system date/time, UI display language, password recover settings etc.	9.3
Import/Export Configuration File	When you want to save current system configurations into a backup file or restore the system configurations from a previously saved file.	9.4
Upgrade System Software	When you want to upgrade the system’s software version.	9.5
Connect to a Network Management System	When you want to connect the device to a network management system to achieve centralized management.	9.6
Configuring Timeout Values	When you need to adjust system timeout configurations to meet your network requirements or to raise system performance.	9.7

System Maintenance		
Monitoring Sessions and Online Users	To view the list of currently established sessions and the authenticated users that are online. This operation also allows you to view DHCP lease information.	10.2
Viewing Reports	When you want to enable or disable report monitoring or view real-time or history reports of various system statuses.	10.3
Performing Network Diagnostics	When you want to execute Ping or Traceroute commands to check for network connectivity between SifoWorks and external networks.	10.4
Restoring System Settings	When you need to restore the system's configurations to factory default settings, retrieve the administrative IP or restore the default administrator password to the default setting. This operation is normally performed if you need to restore the system due to system failures.	10.5

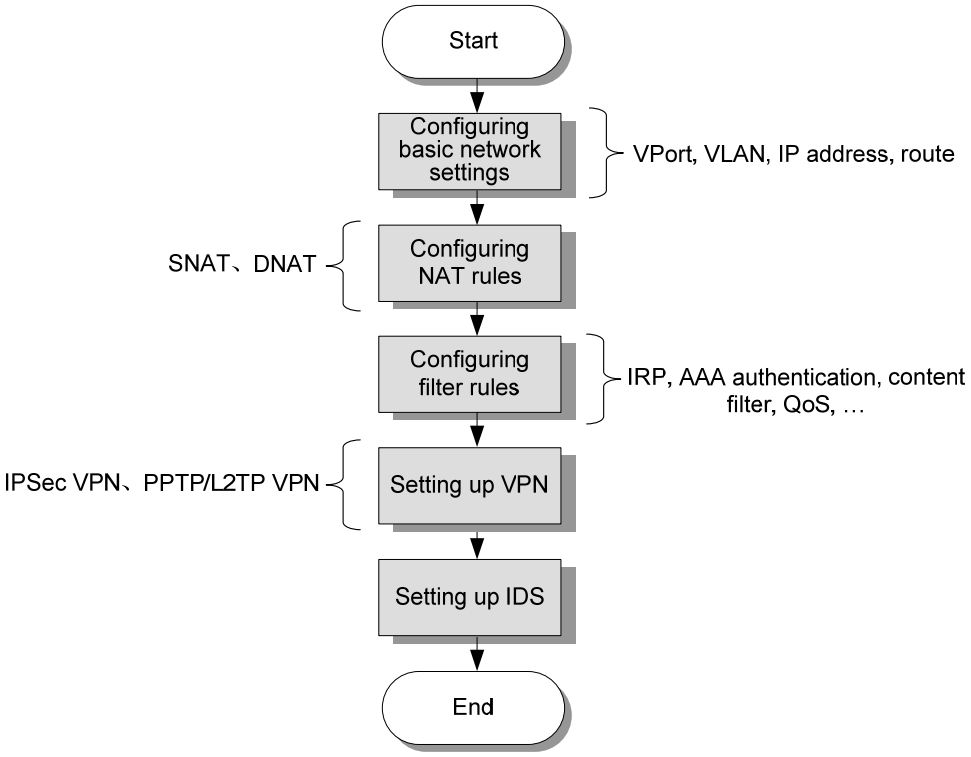
2.5 Device Quick Configuration Guide

The flowchart below shows the recommended configuration procedure to deploy SifoWorks in your existing network such that the device's main functionalities operate properly.

Note:

An application example using this procedure can be found at "11 Device Deployment Example".

For details on each configuration task in the following procedure, please refer to "2.4 Task List" where you can find links to the corresponding tasks.



Each operation in this flowchart is briefly explained in the table below.

Operation	Description	Reference
Configuring Basic Network Parameters	Configure the device's VPort, VLAN, IP address and route settings to connect SifoWorks to the networks	3.2 Setting up the Basic Network Settings
Configuring NAT	Add SNAT (Source Network Address Translation) and DNAT (Destination Network Address Translation) rules according to your network requirements. If you require a large number of SNAT rules, you can apply MapList objects to the rules instead, reducing the amount of SNAT rules to be added. You can also achieve load balancing among multiple servers by applying server load balancing objects in DNAT rules.	3.3 Configuring Network Address Translation
Setting up Filter Rules	Set up the filter rules used to control traffic in the network. Common types of filter rules include: • IRP (Intelligent Recognized Protocol) • AAA Authentication Control accesses by users to be authenticated by local or remote (RADIUS/LDAP/AD) authentication servers. • Content Filtering • QoS In each filter rule, you can • Specify the incoming and outgoing interfaces a rule applies to by selecting Virtual Port and VLAN. • Specify the data packets to apply a rule using attributes such as IP address, authentication user, service or source MAC address etc. • Select whether to "Accept" or "Drop" data packets matching the rule.	4.2 Managing Filter Rules 4.4 Managing Content Filtering Rules 7.2 Setting Up QoS Services

Operation	Description	Reference
	• (Optional) Enable the Intelligent Recognized Protocol option to control illegal data flows. • If the rule action is “Accept”, you can apply content filtering rules to the filter rule to filter the contents of the data packets. • If the rule action is “Accept”, you can enable QoS to limit the maximum and guaranteed bandwidth available for the incoming and outgoing interfaces. • If the rule action is “Accept”, you can specify the maximum number of concurrent sessions allowed and limit the number of connections allowed per host or network domain. • Select a schedule to specify the time period during which the rule is effective.	
Configuring VPN Settings	Configure the IPsec VPN, PPTP VPN and/or L2TP VPN settings to allow remote users to establish VPN connections with SifoWorks.	6.2 Configuring IPsec VPN Connections 6.3 Configuring PPTP VPN Connections 6.4 Configuring L2TP VPN Connections
Setting up IDS	Configure SifoWorks’ own IDS service or connect the device to a third-party IDS device to provide this service.	7.5 Configuring IDS Services

Note: Detailed explanation of each of the above device functions can be found in the “Overview” section of the corresponding chapter or in the function’s own section in this manual.

Chapter

3

Network Configuration

This chapter includes the following sections:

- Overview

  Brief introduction on the various network configuration operations.

- Setting up the Basic Network Settings

  Explains the various network configurations needed to successfully connect SifoWorks to your network including virtual port, VLAN, IP address and route configurations.

- Configuring Network Address Translation

  Describes how to add source and/or destination network address translations.

- Setting up DHCP Service

  Introduces the procedure to set up SifoWorks to act as a DHCP server or DHCP relay server to provide DHCP services.

- Configuring PPPoE Connections

  Explains, in detail, how to set up SifoWorks to connect to external networks via PPPoE.

- Specifying DNS Servers

  Explains how to specify IP addresses of DNS servers to equip SifoWorks with domain name resolution capabilities.

- Configuring DDNS

  Describes the procedure to connect SifoWorks to DDNS servers to provide DDNS services. This allows users to establish dynamic VPN connections using the PPPoE access methods.

- Managing IP-MAC Bindings

  Introduces the system's IP-MAC binding function, preventing IP addresses from being used by illegal hosts.

- Managing the ARP Tables

  Describes how to manage the static and dynamic ARP tables to reduce security risks due to ARP/IP spoofing.

Administrators can refer to this chapter when they need to configure related network settings on the SifoWorks system.

3.1 Overview

Network configuration is a basic module of the SifoWorks system. This module allows administrators to set up the system to connect to the network and provide network related services. Administrators must complete the system's network configurations according to their actual network requirements.

To connect SifoWorks to your network correctly, you must first set up the basic network settings to configure the device's virtual ports, VLAN, IP addresses and routes. Please refer to "3.2 Setting up the Basic Network Settings" for more information.

The remaining sections also describes the procedures to set up SifoWorks to provide NAT, DHCP services, DNS and DDNS services, IP-MAC binding mechanism and manage the device's ARP tables. You can also set up the device to connect to external networks via PPPoE.

3.2 Setting up the Basic Network Settings

This operation guides you through configuring the device's virtual ports, VLANs, IP addresses and routes necessary to connect SifoWorks correctly in your network.

Virtual Ports

SifoWorks supports up to three virtual ports: Virtual Port 1, Virtual Port 2 and Virtual Port 3. These are not physical ports on the device but are logical ports used to facilitate the management of the device's data ports.

Assigning physical data ports to virtual ports allow you to easily manage the ports when defining filter rules. Filter rules incoming and outgoing interfaces are defined using virtual ports, thus allowing you to map multiple physical ports to a single rule. For example, the physical ports FE0-FE2 are assigned to VPort1 while FE3-FE5 are assigned to VPort2. To define a filter rule that matches traffic sent from FE0-FE2 to FE3-FE5, simply select the incoming interface to be VPort1 and the outgoing interface to be VPort2.

SifoWorks supports 3 virtual ports: Virtual Port 1 (VPort1), Virtual Port 2 (VPort2) and Virtual Port 3 (VPort3). All physical data ports (FE0-FE7) must be assigned to one of the 3 virtual ports. Each data port can only be assigned to a single virtual port. Each virtual port can contain multiple data ports.

VLAN (Virtual Local Area Network)

Virtual local area networks (VLAN) define a logical separation of local area networks into individual network segments. The main uses of VLANs include:

- Separates interfaces

  Interfaces assigned to different VLANs can be blocked from communicating with each other even if the interfaces are on the same switch. Thus, a single physical switch can be logically viewed as multiple switches.

- Enhances network security

  VLANs cannot communicate with each other, thus reducing security risks due to broadcast packets.

- Facilitate management

  VLANs allow administrators to modify the network a user belongs to via software configuration instead of having to re-arrange the physical cable connections.

SifoWorks identifies the incoming and outgoing interfaces of a filter rule using virtual ports and VLANs. Hence, VLANs can be simplified to be used by SifoWorks to separate network domains of differing security attributes. A VLAN should be added for each of these domains. Each VLAN is then assigned to one or more physical SifoWorks data port.

For example, the network domain where the company's employees are located should be assigned to 1 VLAN, "LAN", assigned with the physical ports FE0 and FE1. The domain where the company's servers (such as Web server, mail server etc.) are located is assigned to another VLAN, "DMZ", assigned with FE2. A third VLAN, "WAN", with data port FE3, is used to identify external networks.

IP, Route and DHCP

According to the actual network environment, you should add IP addresses to each VLAN and set up SifoWorks to provide DHCP service or DHCP relay service for each VLAN. You should also add the necessary static routes and policy routes (if any) for your network.

VLAN IP addresses can be manually added via the system's UI. You can also set up SifoWorks to dynamically assign IP address, gateway and DNS server address information via DHCP. You must enable SifoWorks' DHCP Client function for the specific VLAN to dynamically assign IP addresses to. When enabled:

- You will be able to view various information including the assigned IP address, gateway and DNS server etc. Click **[Refresh]** to view the status of the connection between the DHCP server and SifoWorks. The possible status include: "Connecting", "Connected" and "Failed". Click **[Release]** to release the currently assigned IP address. You can then manually add another static IP address or select to obtain a new IP dynamically.
- When an IP address is dynamically assigned and a static route specifying the default gateway corresponding to the VLAN has not been added, SifoWorks automatically adds the gateway address obtained from the DHCP server as a static route in the **"Network > Route Setting"** list.

  For example, the dynamic IP address obtained is 192.168.1.100/255.255.0.0 and the gateway is 192.168.0.1. SifoWorks will generate a static route using the address 192.168.0.1 as the default gateway for the network segment 0.0.0.0/0.0.0.0.

  This operation is not executed if a static route has already been added prior to the dynamic IP assignment.

- If the system has been configured to assign DNS information when assigning dynamic IP addresses and no DNS server address has been added in the **"Network > DNS Setting"** interface, the system automatically sets up SifoWorks DNS setting using the DNS information obtained.
- If a VLAN has been configured with the DHCP service (either DHCP server or DHCP relay server), SifoWorks' DHCP Client function will not be effective for this VLAN. Hence, the VLAN cannot be dynamically assigned with an IP address.

📖 Note:

For details on DNS and DHCP, please refer to "3.6 Specifying DNS Servers" and "3.4 Setting up DHCP Service" respectively.

You can assign VLAN IP's manually or dynamically under HA mode. For details on HA, please refer to "7.4 Activating High Availability".

Working Mode

SifoWorks supports 3 working modes including transparent mode, route mode and hybrid mode. When two data ports assigned to different virtual

ports belong to the same VLAN, these two ports are operating in transparent mode. When two data ports are assigned to different VLANs, these ports operate in route mode.

- The system is running in transparent mode if all its data ports are operating in transparent mode.
- The system is running in route mode if all its data ports are operating in route mode.
- If a portion of the system's data ports are running in route mode while another group of ports are running in transparent mode, the system is operating in hybrid mode.

Access Mode and Trunk Mode

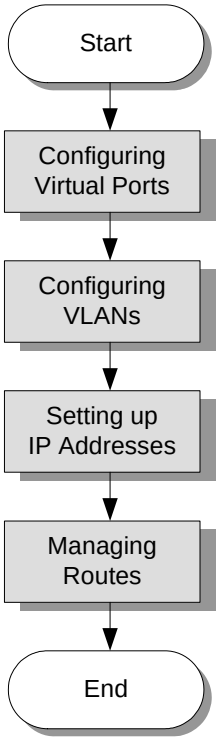
This refers to a VLAN's working mode. Under access mode, the same data port can only be assigned to a single VLAN. Under trunk mode, the same data port can be assigned to multiple VLANs.

Static Routes and Policy Routes

The system supports both static routes and policy routes with policy routes giving greater flexibility over routing control. The system prioritizes policy routes.

CONFIGURATION FLOWCHART

The steps to set up the system's basic network settings are shown in the flowchart below.



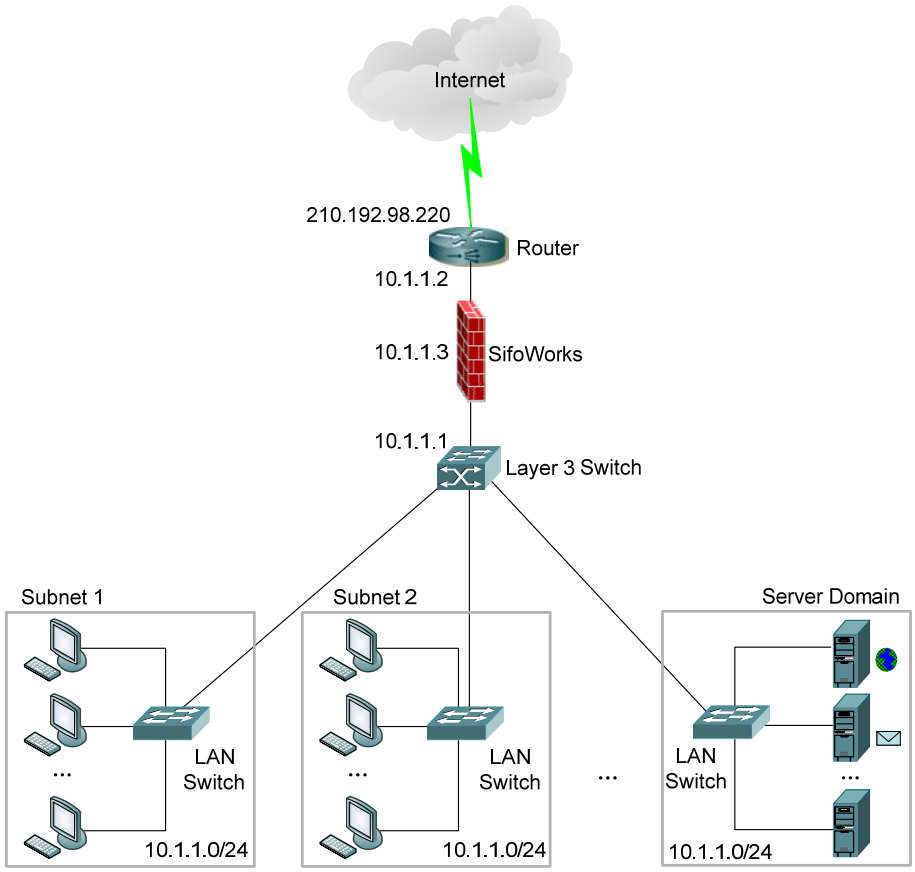
Each step is briefly described in the table below.

Operation	Description
Configuring Virtual Ports	Assigning the data ports to the virtual ports.
Configuring VLANs	Add VLANs and assign data ports to VLANs.
Setting up IP Addresses	Configuring the IP addresses of each VLAN. This can be static IPs added manually or dynamic IPs obtained from a DHCP server.
Managing Routes	Adding route information into the system.

APPLICATION EXAMPLE 1 – TRANSPARENT MODE

A company uses private IP addresses within its internal networks, connecting to external networks via a layer 3 switch and a router. The external IP address is 210.192.98.220.

For the security of the network and to manage network performance, the company deploys SifoWorks between the layer 3 switch and router. The company's network topology is shown below.



Note:

The IP address "10.1.1.3" in the figure below is used to configure SifoWorks via a data port. You need not add this IP address if you are configuring the system via the monitor port only.

SifoWorks is connected to the switch via FE0. SifoWorks is connected to the router via FE1. The configuration plan is as follows:

Parameter	Configuration Value
Virtual Port 1	FE0
Virtual Port 2	FE1
Virtual Port 3	All other ports
VLAN1	FE0, FE1

Parameter	Configuration Value
IP Address of VLAN1	10.1.1.3/255.255.255.0
Route	-

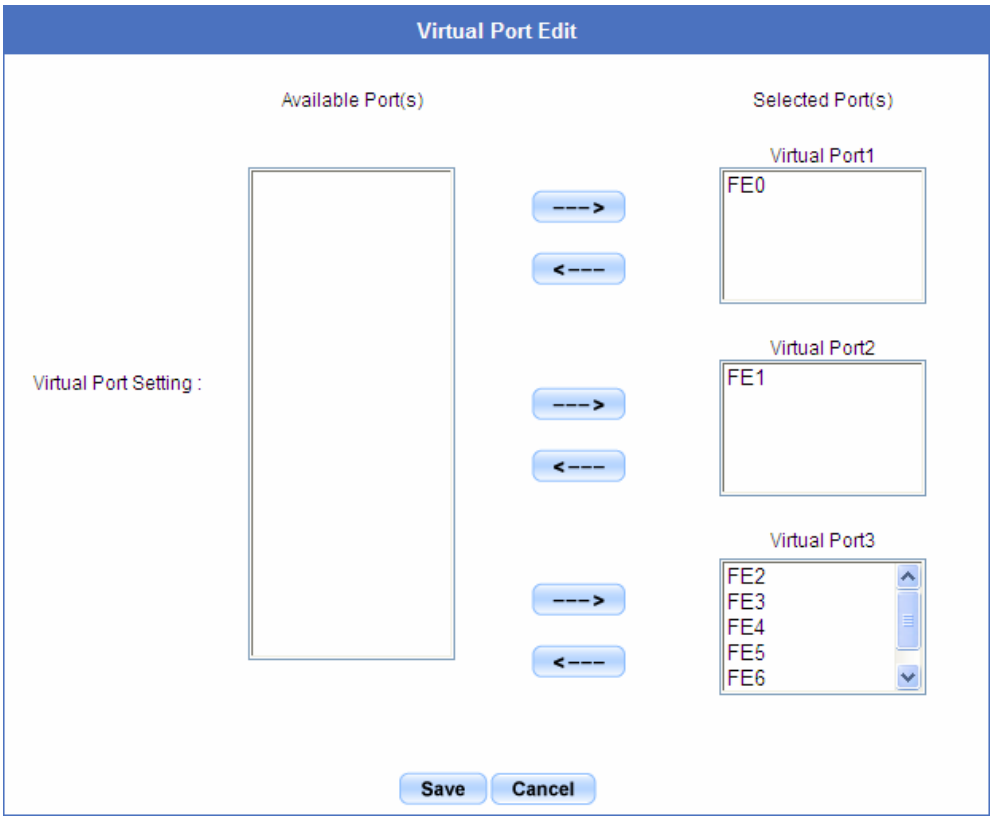
Note: This example does not require the addition of routes.

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Configuring Virtual Ports

1. From the left menu bar, select **"Network > Virtual Port Config"**.
2. In this interface, click the **[Virtual Port Config]** button to display the "Virtual Port Edit" interface
3. Using the ---> and <--- buttons, move port FE0 to **Virtual Port1** and port FE1 to **Virtual Port2**. Move all other ports to **Virtual Port3**.



4. Click **[Save]** to save the configuration.

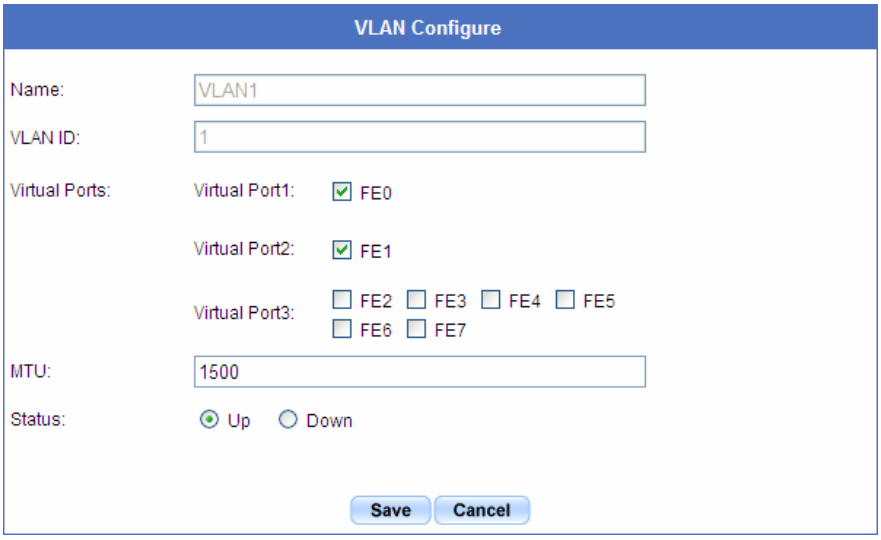
Step 3 Configuring VLANs

1. From the left menu bar, select **"Network > VLAN Setting"** to view the VLAN list.
2. Click the icon corresponding to "VLAN1" in the list.
3. The "VLAN Configure" interface will be displayed. Configure as follows:

   Virtual Ports: FE0, FE1

   MTU: 1500

   Status: On



4. Click **[Save]** to save the configurations.

Step 4 Setting up IP Addresses

1. From the left menu bar, select **"Network > IP Config"**.
2. From the list of VLANs displayed, click the icon corresponding to "VLAN1".
3. The "Show IP Configure" interface will be displayed. Select the "Static IP Address" option and click **[Add New IP]**.
4. Enter the **IP** 10.1.1.3 and **Netmask** 255.255.255.0.
5. Click **[Save]** to save the new IP address and return to the "Show IP Configure" interface.
6. Click **[Return]** to return to the VLAN IP list.

APPLICATION EXAMPLE 2 – ROUTE MODE

In this example, a company separates its network into 3 domains:

- LAN

  Internal workstation PCs are located in this domain. The subnet address is 192.168.1.0/255.255.255.0.

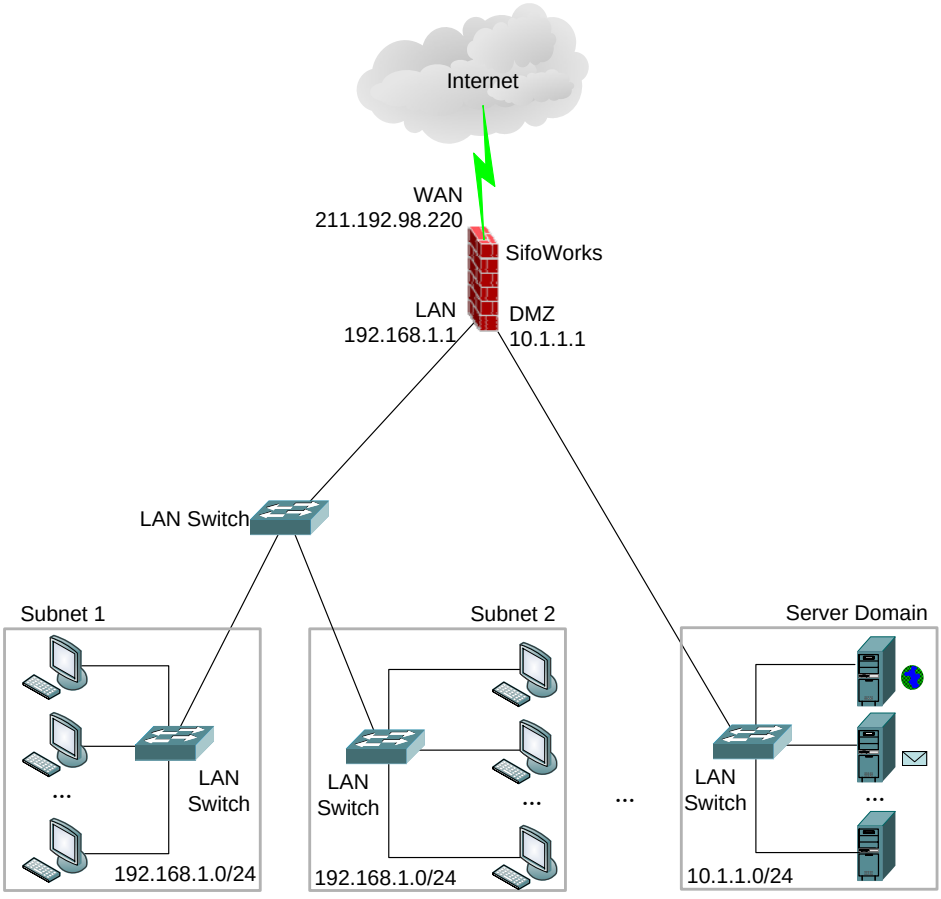
- WAN

  The external network (Internet) with IP address 211.192.98.220.

- DMZ

  Internal servers such as web and FTP servers are located in this domain. The subnet address is 10.1.1.0/255.255.255.0.

For the security of the network and to manage network performance, the company deploys SifoWorks as the external gateway and connects the 3 network domains to the device. The company's network topology is shown below.



SifoWorks is connected to LAN via FE0, WAN via FE1 and DMZ via FE2. The first hop address from the firewall to the Internet is 211.192.98.217. The configuration plan is shown in the following table.

Parameter		Configuration Value
Virtual Port	Virtual Port 1	FE0
	Virtual Port 2	FE1
	Virtual Port 3	All other ports
VLAN	LAN	Virtual Port 1: FE0
		Virtual Port 2: None
		Virtual Port 3: None
	WAN	Virtual Port 1: None
		Virtual Port 2: FE1
		Virtual Port 3: None
	DMZ	Virtual Port 1: None
		Virtual Port 2: None
		Virtual Port 3: FE2
IP Address	LAN	192.168.1.1/255.255.255.0
	WAN	211.192.98.220/255.255.255.0
	DMZ	10.1.1.1/255.255.255.0
Static Routes		Destination/Netmask: 0.0.0.0/0.0.0.0 Gateway: 211.192.98.217 Outgoing Interface: WAN

The configuration procedure is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 Configuring Virtual Ports

1. From the left menu bar, select **"Network > Virtual Port Config"**.
2. Click **[Virtual Port Config]** from the bottom of the virtual port list to view the "Virtual Port Edit" interface.
3. Using the ---> and <--- buttons, move "FE0" to **Virtual Port1**, "FE1" to **Virtual Port2** and all other ports to **Virtual Port3**.
4. Click **[Save]** to save the configuration and return to the Virtual Port list.

Step 3 Configuring VLANs

1. From the left menu bar, select **"Network > VLAN Setting"** to display the list of VLANs.
2. Click the icon corresponding to "VLAN1" and unselect all data ports from the VLAN.
3. Return to the VLAN list and click **[Add New VLAN]** and configure the following:

   Name: LAN

   VLAN ID: 2

   Select the port "FE0".

   MTU: 1500

   Status: Up
4. Click **[Save]** to save and return to the VLAN list.
5. Repeat steps 2-4 to add two other VLANs for the WAN and DMZ domains. The resulting list of VLANs is shown in the figure below.

VLAN | Port

VLAN Name	VID	VPorts	User Ports	Operation
ADMIN	0	N/A	MGT0	
VLAN1	1	Virtual Port1 Virtual Port2 Virtual Port3		
LAN	2	Virtual Port1 Virtual Port Virtual Port3	FE0	
WAN	3	Virtual Port1 Virtual Port2 Virtual Port3	FE1	
DMZ	4	Virtual Port1 Virtual Port2 Virtual Port3	FE2	

Step 4 Setting up IP Addresses

1. From the left menu bar, select **"Network > IP Config"**.
2. From the list displayed, click the icon corresponding to "LAN". The system will display the "Show IP Configure" configuration interface.
3. Select "Static IP Address" and Click **[Add New IP]**.
4. In the next interface, configure **IP** as "192.168.1.1" and **netmask** "255.255.255.0".
5. Click **[Save]** to save the new IP address and return to the "Show IP configure" interface.
6. Click **[Return]** to return to the VLAN IP list.
7. Repeat steps 2-6 and configure "211.192.98.220/255.255.255.0" for the "WAN" VLAN and "10.1.1.1/255.255.255.0" for the "DMZ" VLAN. The resulting VLAN IP list is shown below.

Index	VLAN Name	VLAN ID	IP Address	Netmask	Operation
0	ADMIN	0	172.16.0.1	255.255.0.0	
1	VLAN1	1			
2	LAN	2	192.168.1.1	255.255.255.0	
3	WAN	3	211.192.98.220	255.255.255.0	
4	DMZ	4	10.1.1.1	255.255.255.0	

Step 5 Managing Routes

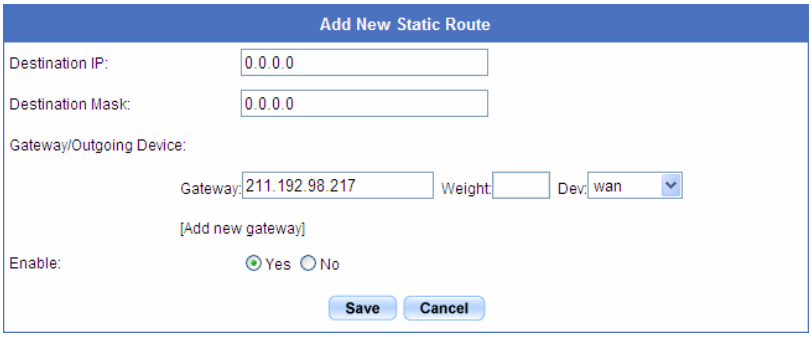
1. From the left menu bar, select **"Network > Route Setting"** to view the system's route list.
2. Click **[Clear Invalid Route]** to remove all unused routes from the list.
3. Click **[Add New Static Route]** from the bottom of the list.
4. In the "Add New Static Route" interface that appears, configure the following:

   Destination IP: 0.0.0.0

   Destination Mask: 0.0.0.0

   Gateway: 211.192.98.217

   Dev: WAN



5. Click **[Save]** to save the route and return to the route list.

APPLICATION EXAMPLE 3 – HYBRID MODE

In this example, the company's network is separated into two domains:

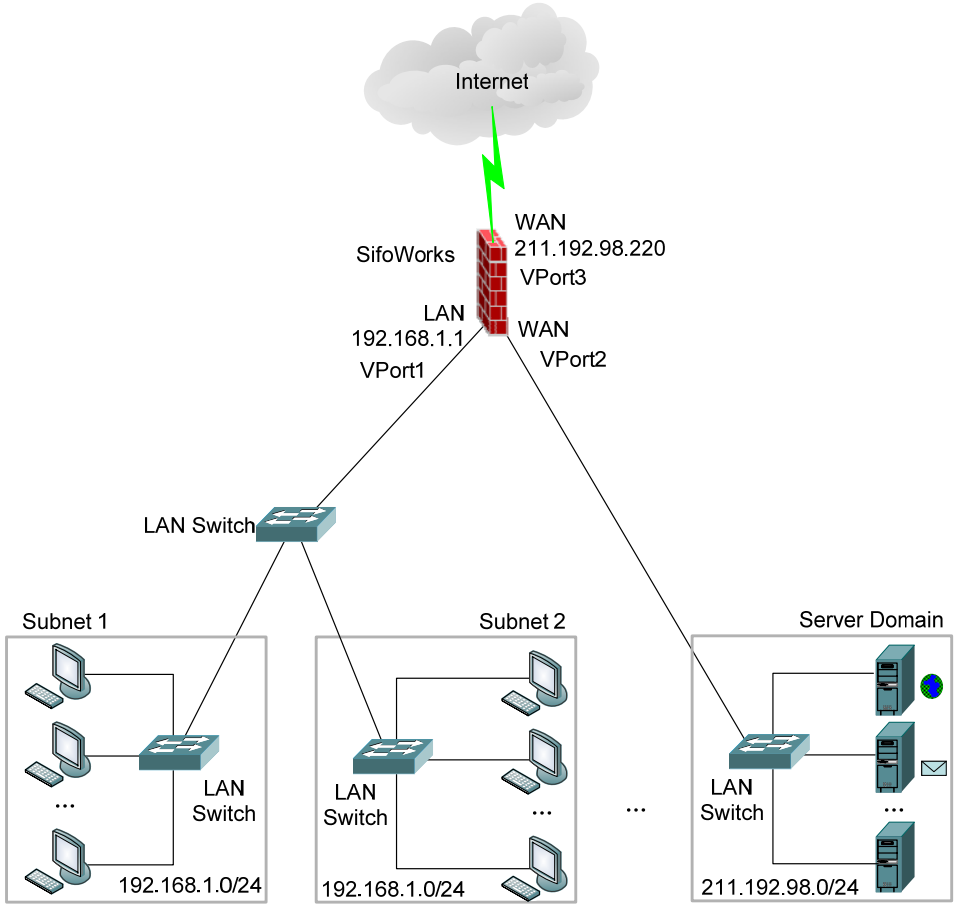
- LAN

  Internal workstation PCs are located in this domain. The subnet address is 192.168.1.0/255.255.255.0.

- WAN

  This includes the Internet and a domain where various servers such as Web and Mail servers are located. The subnet address is 211.192.98.0/255.255.255.0.

For the security of the network and to manage network performance, the company deploys SifoWorks as the external gateway and connects the LAN and server domain to the device. The company's network topology is shown below.



SifoWorks' FE0 is connected to the LAN network, FE1 to the Internet and FE2 to the WAN domain containing the web and mail servers. The first hop gateway address between the firewall and the Internet is 211.192.98.217. The configuration plan is as follows:

Parameter		Configuration Value
Virtual Port	Virtual Port 1	FE0
	Virtual Port 2	FE1
	Virtual Port 3	All other ports
VLAN	LAN	Virtual Port 1: FE0
		Virtual Port 2: None
		Virtual Port 3: None
	WAN	Virtual Port 1: None
		Virtual Port 2: FE1
		Virtual Port 3: FE2
IP Address	LAN	192.168.1.1/255.255.255.0
	WAN	211.192.98.220/255.255.255.0
Static Routes		Destination/Netmask: 0.0.0.0/0.0.0.0 Gateway: 211.192.98.217 Outgoing Interface: WAN

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Configuring Virtual Ports

1. From the left menu bar, select **"Network > Virtual Port Config"**.
2. Click **[Virtual Port Config]** from the bottom of the virtual port list to view the "Virtual Port Edit" interface.
3. Using the ---> and <--- buttons, move "FE0" to **Virtual Port1**, "FE1" to **Virtual Port2** and all other ports to **Virtual Port3**.
4. Click **[Save]** to save the configuration and return to the Virtual Port list.

Step 3 Configuring VLANs

1. From the left menu bar, select **"Network > VLAN Setting"** to display the list of VLANs.
2. Click the icon corresponding to "VLAN1" and unselect all data ports from the VLAN.
3. Return to the VLAN list. Click **[Add New VLAN]** and configure as follows:

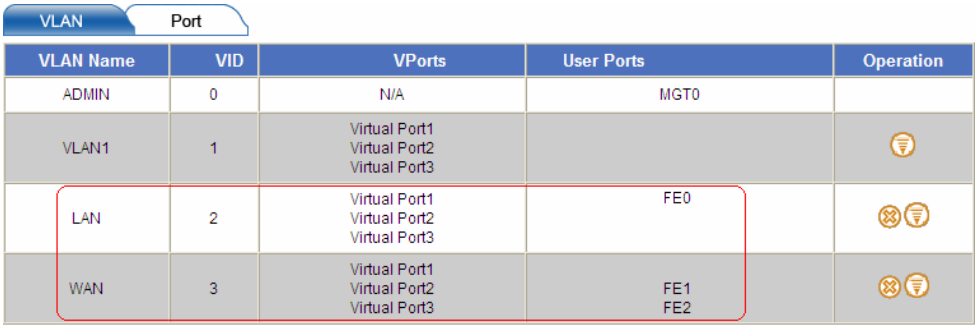
   Name: LAN

   VLAN ID: 2

   Select the port "FE0".

   MTU: 1500

   Status: Up
4. Click **[Save]** to save and return to the VLAN list.
5. Repeat steps 2-4 to add a "WAN" VLAN. The final VLAN list is shown in the figure below.



VLAN Name	VID	VPorts	User Ports	Operation
ADMIN	0	N/A	MGT0	
VLAN1	1	Virtual Port1 Virtual Port2 Virtual Port3		
LAN	2	Virtual Port1 Virtual Port2 Virtual Port3	FE0	
WAN	3	Virtual Port1 Virtual Port2 Virtual Port3	FE1 FE2	

Step 4 Setting up IP Addresses

1. From the left menu bar, select **"Network > IP Config"**.
2. From the list displayed, click the icon corresponding to "LAN". The system will display the "Show IP Configure" configuration interface.
3. Select "Static IP Address" and click **[Add New IP]**.
4. In the next interface, configure **IP** as "192.168.1.1" and **netmask** "255.255.255.0".
5. Click **[Save]** to save the new IP address and return to the "Show IP configure" interface.
6. Click **[Return]** to return to the VLAN IP list.
7. Repeat steps 2-6 and add IP/netmask "211.192.98.220/ 255.255.255.0" for the "WAN" VLAN.

Index	VLAN Name	VLAN ID	IP Address	Netmask	Operation
0	ADMIN	0	172.16.0.1	255.255.0.0	
1	VLAN1	1			
2	LAN	2	192.168.1.1	255.255.255.0	
3	WAN	3	211.192.98.220	255.255.255.0	

Step 5 Managing Routes

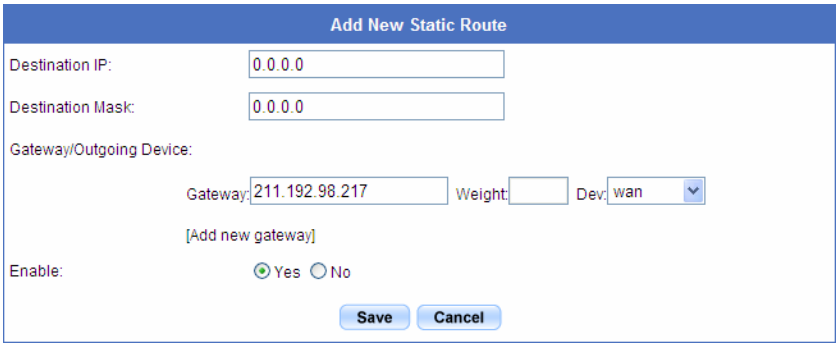
1. From the left menu bar, select **"Network > Route Setting"** to view the system's route list.
2. Click **[Clear Invalid Route]** to remove all unused routes from the list.
3. Click **[Add New Static Route]** from the bottom of the list.
4. In the "Add New Static Route" interface that appears, configure the following:

   Destination IP: 0.0.0.0

   Destination Mask: 0.0.0.0

   Gateway: 211.192.98.217

   Dev: WAN



5. Click **[Save]** to save the route and return to the static route list.

3.3 Configuring Network Address Translation

This section explains how to manage source and destination NAT in SifoWorks.

Note that your system's basic network configurations should already be properly set up. Please refer to "3.2 Setting up the Basic Network Settings" for information on configuring SifoWorks' basic network settings.

Source NAT (SNAT)

Performs address translation on the source address of all data packets matching the rule. Source NAT is mainly used for accesses to the external networks from internal users.

Destination NAT (DNAT)

Performs address translation on the destination address of all data packets matching the rule. Destination NAT is mainly used for accesses to the internal network (such as accesses to an internal web server) from an external user.

Map List

A maplist object contains a list of multiple address mappings. This object can be applied on SNAT rules. The system supports up to 10 maplist objects. Each object can contain a maximum of 1000 address mappings.

As each maplist object can contain multiple address mappings, the use of these objects can greatly reduce the number of SNAT rules, thus optimizing system performance. Furthermore, SifoWorks uses the quick search function to search for matching SNAT rules using maplist objects. This greatly reduces the search time, further enhancing the performance of the system.

Hence, we recommend adding SNAT rules that uses maplist objects if your network requires several source network address translations for non-continuous IP addresses or port numbers.

Server Load Balancing

SifoWorks is able to balance traffic load on multiple servers via DNAT rules. You can add up to 10 DNAT rules that apply server load balance objects. Up to 20 servers can be defined in each object.

The system supports two load balancing mechanisms: round-robin and server priority. A “Sticky” option is also available in SifoWorks, ensuring that requests from the same host are processed by the same server.

- Round-robin

  External connection requests will be assigned to the servers in a round-robin manner. If “Sticky” is enabled, the system will establish a relationship between source and destination addresses using the hash algorithm. The connection is then assigned to the next available server.

- Server priority

  All servers are assigned with a priority weight value. External connection requests are then distributed to the servers according to their priority. Servers with larger priority weight will be assigned with a larger number of requests.

APPLICATION EXAMPLE 1

According to the network topology in “3.2 Setting up the Basic Network Settings, Application Example 2 – Route Mode” above, you need to add the following NAT rules:

- Source NAT from LAN to WAN

  The translated source IP is 211.192.98.220, port range is 1025-65535.

- Destination NAT from WAN to DMZ

  The translated destination IP is 10.1.1.2. Destination port number after translation is 80.

The configuration procedure is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **“Firewall > NAT Rule”**. The interface refreshes to display the source NAT rule list (“*SNAT*” tab) by default.

Step 3 Add a source NAT rule.

1. From the "*SNAT*" tab, click **[Add New SNAT]**.
2. In the interface displayed, configure as follows:

   Virtual Port From: VPort1

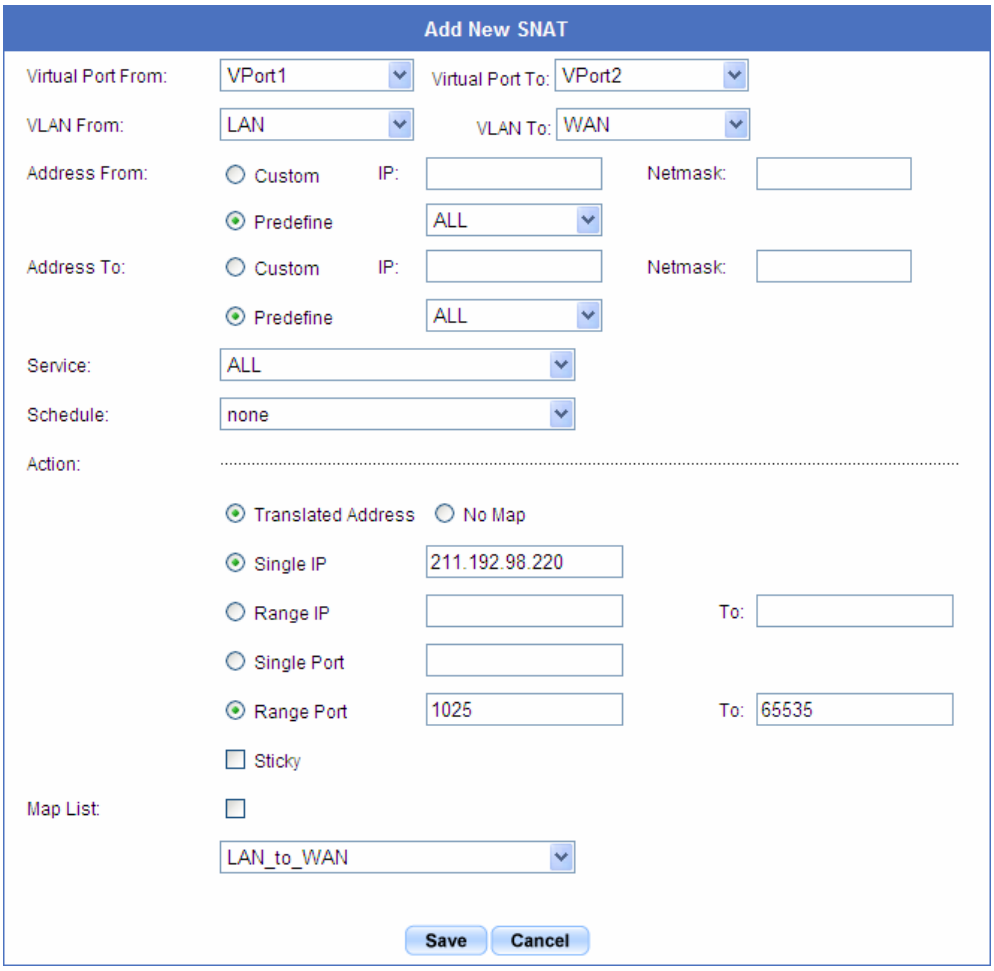
   Virtual Port To: VPort2

   VLAN From: LAN

   VLAN To: WAN

   Single IP: 211.192.98.220

   Range Port: 1025-65535



3. Click **[Save]** to save the new SNAT rule and return to the NAT rule list.

Step 4 Add a destination NAT rule.

1. Back at the "*Source NAT*" tab interface, click the "*Destination NAT*" tab.
2. Click **[Add New NAT Rule]**.
3. In the interface displayed, configure as follows:

   Virtual Port From: VPort2

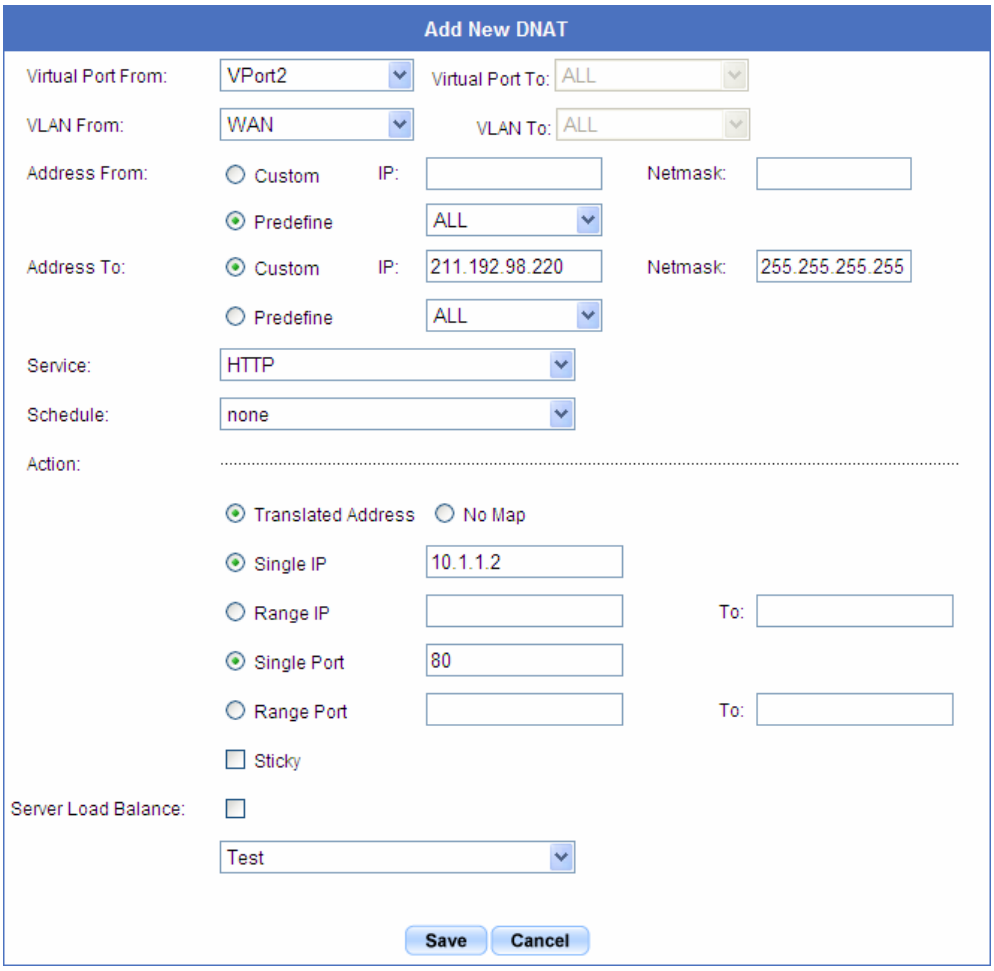
   VLAN From: WAN

   Address To: 211.192.98.220/255.255.255.255

   Service: HTTP

   Single IP: 10.1.1.2

   Single Port: 80



4. Click **[Save]** to save the new DNAT rule.

APPLICATION EXAMPLE 2 – MAPLIST

A network administrator needs to add SNAT rules for all LAN to WAN connections (VPort1 to VPort2) to translate the private IP addresses of all hosts in the LAN network to two public IP address when accessing the external network. The internal addresses include:

Original IP address	Translated IP address/Port number
192.168.1.1 – 192.168.1.100	IP: 211.192.98.220 Port: 1025 – 65535
192.168.2.1 – 192.168.2.100	IP: 211.192.98.220 Port: 1025 – 65535
192.168.3.1 – 192.168.3.100	IP: 210.82.98.220 Port: 1025 – 65535
192.168.4.1 – 192.168.4.100	IP: 210.82.98.220 Port: 1025 – 65535

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Object > MapList"**. The list of maplist objects will be displayed.

Step 3 Add a new maplist object

1. Click **[Add New MapList]** from the bottom of the maplist object list.
2. Set up the maplist object as follows:

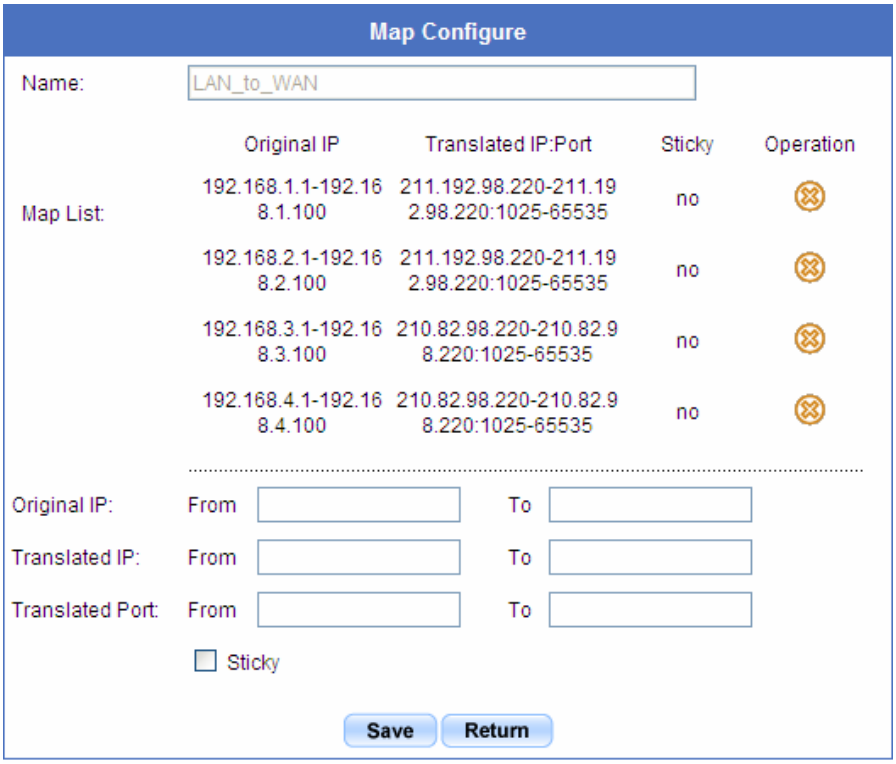
   Name: LAN_to_WAN

   Original IP: From 192.168.1.1 **To** 192.168.1.100

   Translated IP: From 211.192.98.220 **To** 211.192.98.220

   Translated Port: From 1025 **To** 65535

3. Click **[Save]** to save this address mapping.
4. Repeat steps 2 – 3 to add the other 3 address mappings. The final configuration screen should be similar to the figure below.



5. Click **[Return]** to return to the maplist object list.

Step 4 From the left menu bar, select **"Firewall > NAT Rule"**. The "*SNAT*" tab displaying the SNAT rule list will be shown.

Step 5 Add a SNAT rule

1. From the SNAT rule list, click **[Add New SNAT]**.
2. Configure the SNAT rule as follows:

   Virtual Port From: VPort1

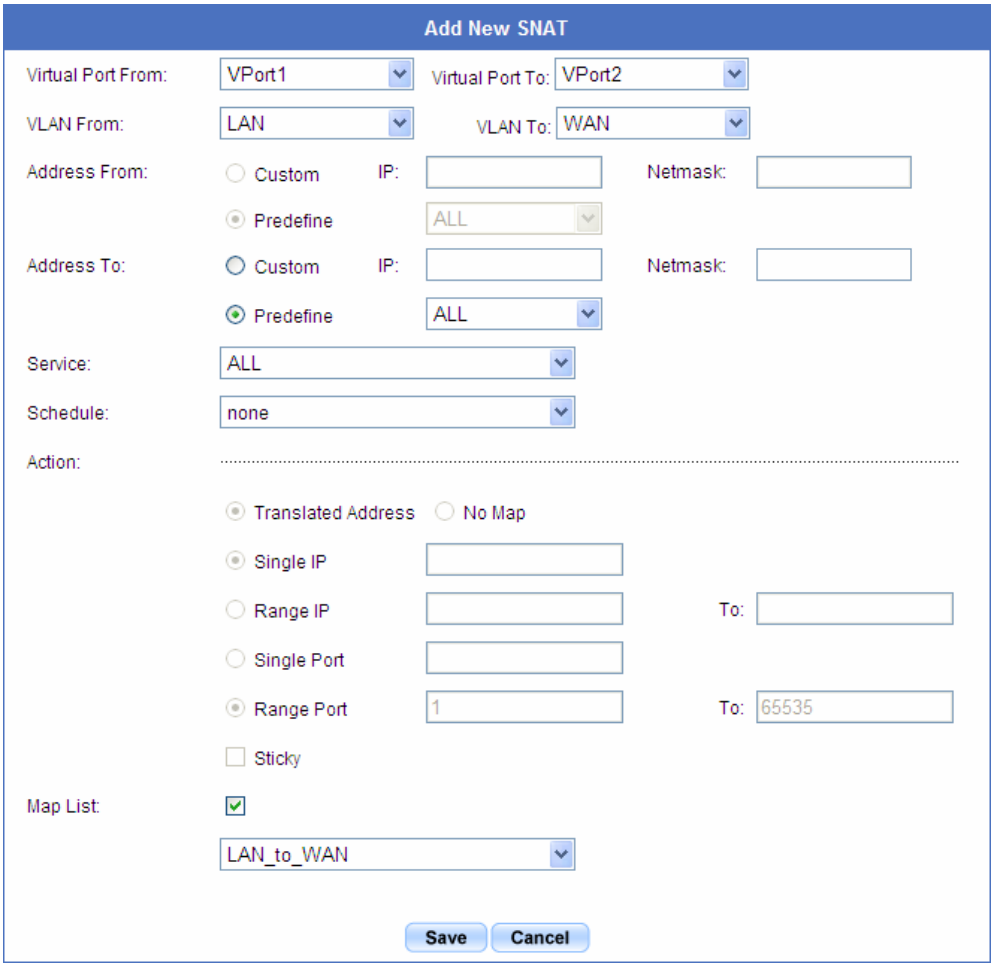
   Virtual Port To: VPort2

   VLAN From: LAN

   VLAN To: WAN

   Address From / Specified: All

3. Check the **MapList** checkbox at the bottom of this interface and select the maplist object "LAN_to_WAN" from the drop down menu. The above configuration is illustrated in the figure below.



4. Click **[Save]** to save the SNAT rule.

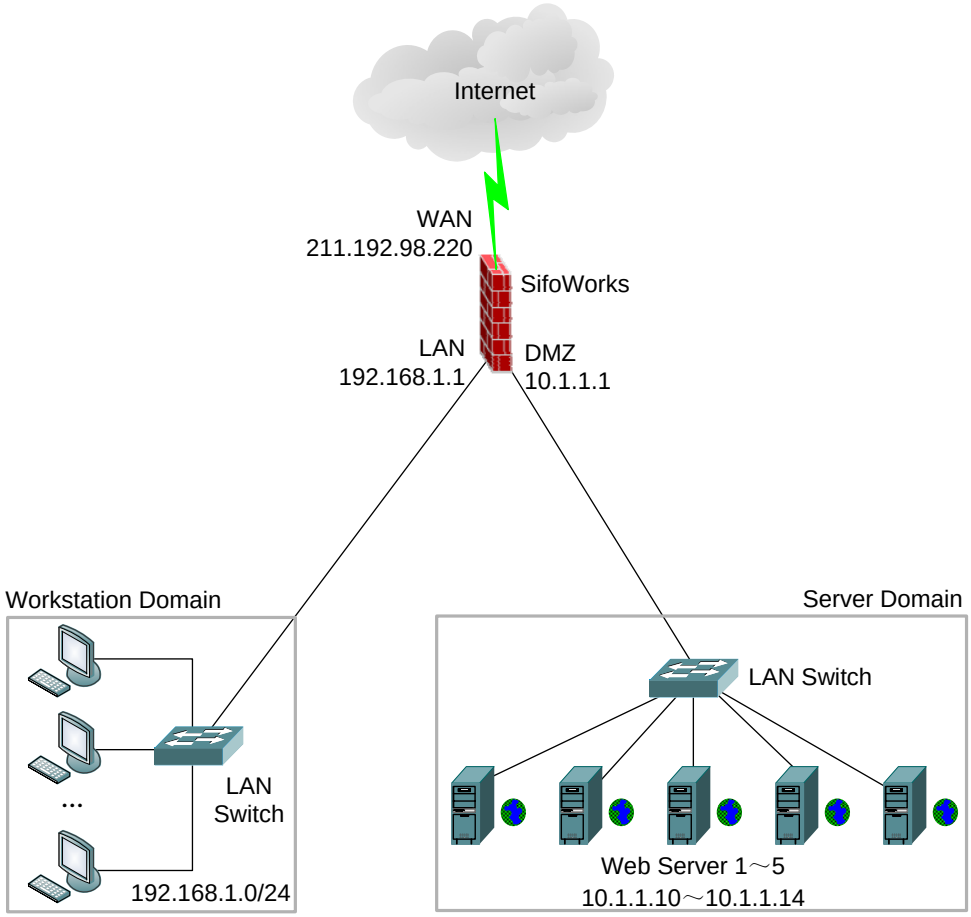
APPLICATION EXAMPLE 3 – LOAD BALANCING

The network topology of a company is shown in the figure below. In the DMZ domain, 5 web servers providing services externally are deployed. SifoWorks must distribute traffic among these servers according to a priority weight system. Traffic should be distributed of traffic among Web Server1 to Web Server5 according to the following percentage:

Server 1 : Server 2 : Server 3 : Server 4 : Server 5

20% : 20% : 25% : 25% : 10%

The “Sticky” option should also be enabled.



The company also requires DNAT to be performed on all accesses from external sources. External hosts access the HTTP service via the IP 211.192.98.220:80. VPort1, VPort2 and VPort3 correspond to the LAN, WAN and DMZ domains respectively.

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write account.

Step 2 From the left menu bar, select **“Object > Server Load Balance”**.

Step 3 Add a new server load balance object

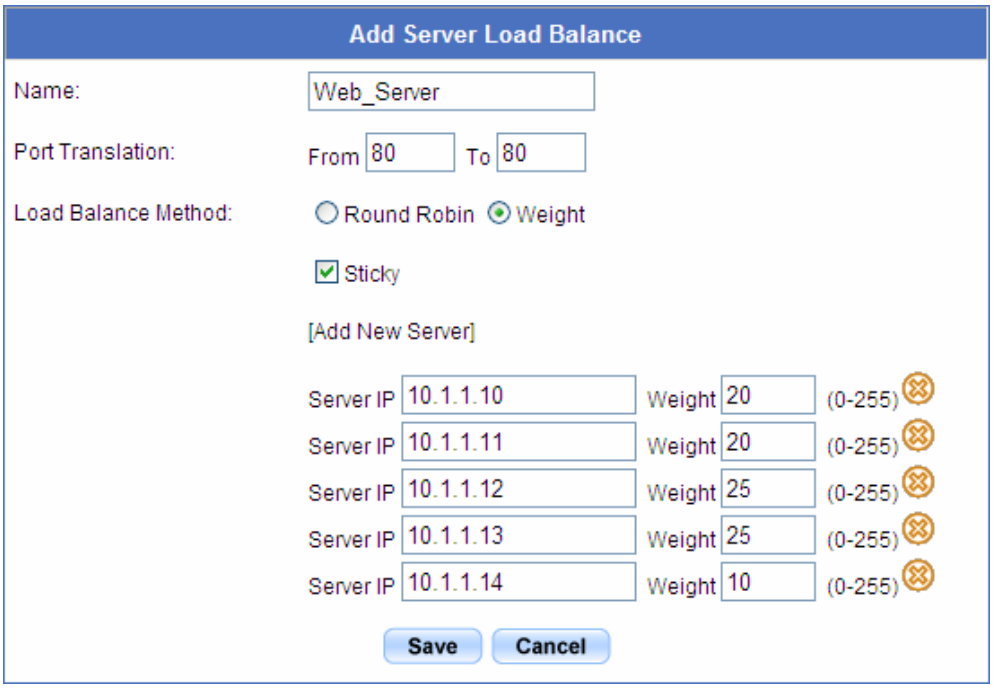
1. From the list of objects displayed, click **[Add Server Load Balance]**.
2. In the "Add Server Load Balance" interface that appears, configure:

   Name: Web_Server

   Port Translation: From 80 **To** 80

   Load Balance Method: Weight

3. Check the checkbox to enable the **Sticky** session function.
4. Click **"[Add New Server]"**. In the **Server IP** textbox that appears, enter the IP address of the first web server "10.1.1.10". In the adjacent **Weight** textbox, enter "20".
5. Repeat (4) to add the remaining 4 web servers. The final configuration interface should be similar to the following figure:



6. Click **[Save]** to save the new server load balance object.

Step 4 From the left menu bar, select **"Firewall > NAT Rule"**. Click the "*DNAT*" tab to view the list of DNAT rules.

Step 5 Add a DNAT rule

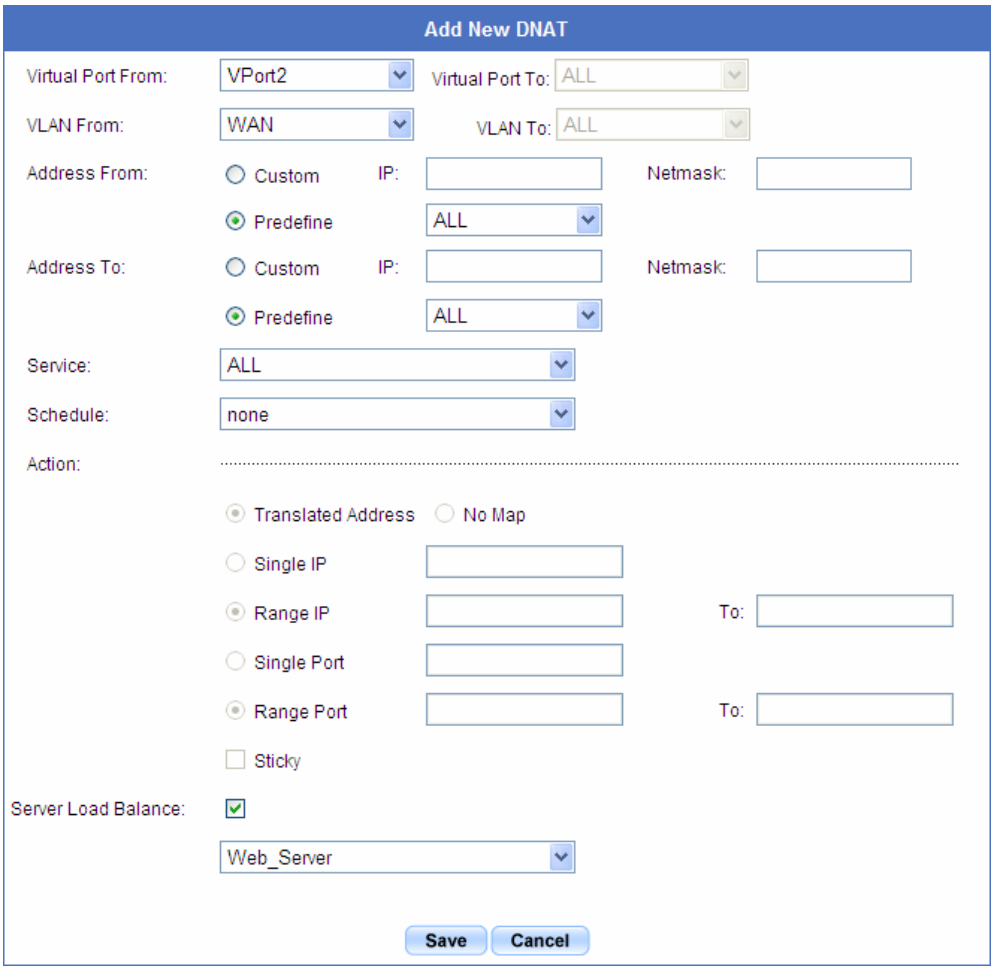
1. Click **[Add New DNAT]**.
2. In the configuration interface that displayed, configure as follows:

   Virtual Port From: VPort2

   VLAN From: WAN

   Address From / Predefine: ALL

   Address To / Predefine: ALL
3. Check the **Server Load Balance** checkbox at the bottom of this interface and select the "Web_Server" object from the drop down menu.



4. Click **[Save]** to save the DNAT rule.

3.4 Setting up DHCP Service

You must perform this configuration to set up SifoWorks to provide DHCP services by either setting up SifoWorks as a DHCP server or using the system as DHCP relay servers.

DHCP Server

A DHCP server dynamically assigns and manages IP addresses and other related parameters such as DNS, WINS and gateway to external hosts.

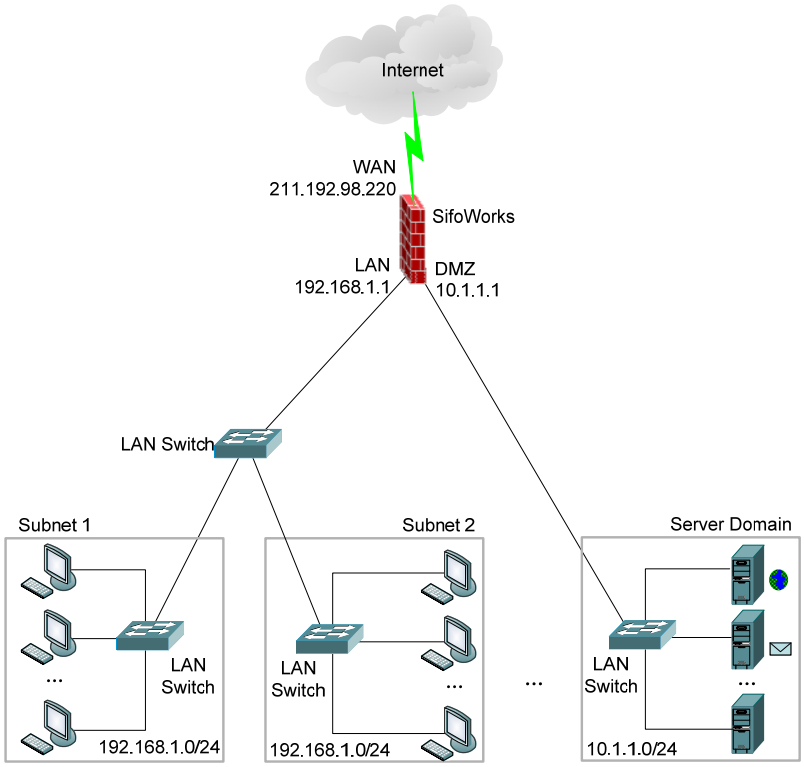
DHCP Relay Server

DHCP relay servers point to a DHCP server located in another subnet, allowing the server to provide DHCP service to hosts on this subnet.

Note that your system's basic network configurations should already be properly set up. Please refer to "3.2 Setting up the Basic Network Settings" for information on configuring SifoWorks' basic network settings.

APPLICATION EXAMPLE 1 – DHCP SERVER

As shown in the figure below, SifoWorks provides DHCP services to the LAN network.



In this network,

- IP address range available for use by the DHCP service is 192.168.1.10 – 192.168.1.100, and 192.168.1.110 – 192.168.1.200
- Gateway IP address of the LAN domain is 192.168.1.1/255.255.255.0
- Default DHCP lease time is 7 days
- Maximum DHCP lease time is 100 days
- IP address of the DNS servers are 192.168.1.3 and 192.168.1.4
- IP address of the WINS servers are 192.168.1.3 and 192.168.1.4

The configuration procedure is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **"Network > DHCP Setting"**.

Step 3 Click the icon corresponding to your LAN network's VLAN from the displayed DHCP list.

Step 4 The "Configure DHCP" interface will be displayed. Configure as follows:

DHCP Service Type: DHCP Server

Gateway: 192.168.1.1

Netmask: 255.255.255.0

Default Lease Period: 7 days 0 hours 0 minutes

Max Lease Period: 100 days 0 hours 0 minutes

DNS Server 1: 192.168.1.3

DNS Server 2: 192.168.1.4

WINS Server 1: 192.168.1.3

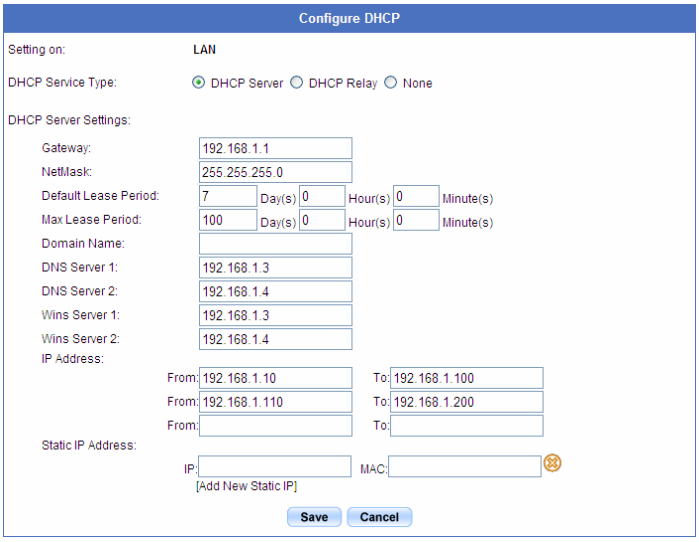
WINS Server 2: 192.168.1.4

IP Address From: 192.168.1.10

IP Address To: 192.168.1.100

IP Address From: 192.168.1.110

IP Address To: 192.168.1.200



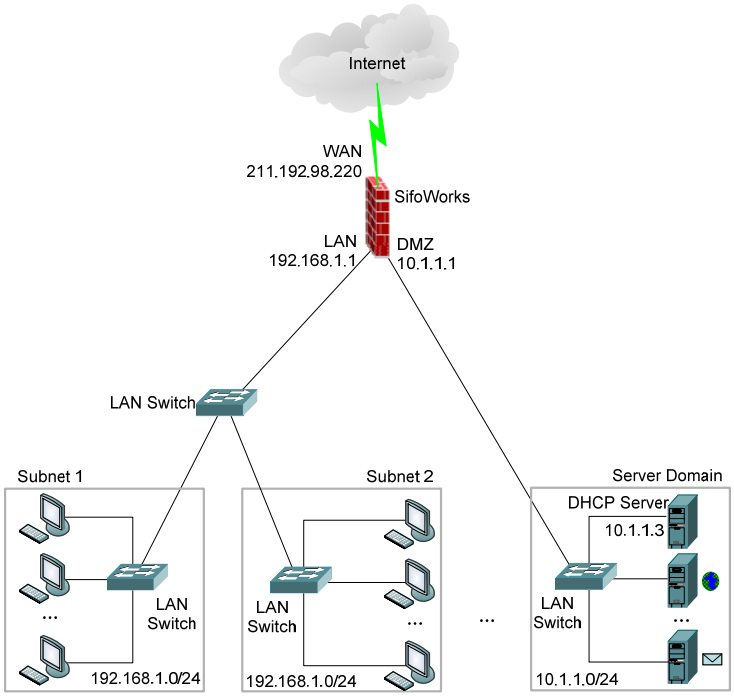
Step 5 Click **[Save]** to save the configuration and return to the DHCP list.

Step 6 Click the icon corresponding to the VLAN representing your LAN network. The **DHCP status** will be displayed as "Running" in the list as shown below.

Index	VLAN Name	DHCP Status	Mode	Gateway/Server	Operation
1	VLAN1	N/A	None		
2	LAN	Running	Server	192.168.0.1	
3	WAN	N/A	None		
4	DMZ	N/A	None		

APPLICATION EXAMPLE 2 – DHCP RELAY SERVER

As shown in the network topology below, SifoWorks is set up to provide DHCP relay services to LAN. IP address of the DHCP server is 10.1.1.3.



The configuration procedure is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **"Network > DHCP Setting"**.

Step 3 Click the icon corresponding to the VLAN representing your LAN network from the displayed DHCP list.

Step 4 The "Configure DHCP" interface will be displayed. Configure as follows:

DHCP Service Type: DHCP Relay

DHCP Relay Server: 10.1.1.3

Interface: DMZ

Step 5 Click **[Save]** to save the configuration and return to the DHCP list.

Step 6 Click the icon corresponding to the VLAN representing your LAN. The **DHCP status** will be displayed as "Running" in the list as shown below.

Index	VLAN Name	DHCP Status	Mode	Gateway/Server	Operation
1	VLAN1	N/A	None		
2	LAN	Running	Relay	10.1.1.3	
3	WAN	N/A	None		
4	DMZ	N/A	None		

3.5 Configuring PPPoE Connections

To set up SifoWorks such that the device is able to establish connections with external networks via the PPPoE access method.

PPPoE (Point to Point Protocol over Ethernet) is a widely used Internet access method. SifoWorks uses the MGT1 port as the interface for PPPoE connections. Two PPPoE modes are supported including:

- Common mode

  The system processes PPPoE traffic via software. Under this mode, simply connect the network cable for PPPoE access to the MGT1 port.

  As PPPoE traffic is handled by software, this mode ties up a large amount of system resources. Hence, if PPPoE traffic in your network is large, we recommend using Fast mode instead.

- Fast mode

  In fast mode, PPPoE traffic is forwarded via hardware by SifoWorks security chip. Here, you must connect the network cable for PPPoE accesses to the MGT1 port, then connect a network cable between MGT0 and FE7.

  Up to 50M of traffic is supported under fast mode. As fast mode forwards PPPoE traffic via hardware, better performance can be observed under this mode.

📖 Note:

As both MGT0 and MGT1 ports are used in fast mode, administrators must login to SifoWorks via the FE0 – FE6 data ports.

When configuring filter rules to support PPPoE connections:

- Under PPPoE common mode, select “PPPoE” in the filter rule’s **Virtual Port From** and **Virtual Port To** parameters. This indicates that the incoming and outgoing interface is MGT1.
- Under PPPoE fast mode, select “ADSL_HIGHSPEED” in the filter rule’s **VLAN From** and **VLAN To** parameters to indicate MGT1 as the incoming and outgoing interface.

When establishing IPsec VPN via PPPoE links:

- You do not need to specify an outgoing interface under PPPoE common mode. Simply select “PPPoE” as the **Local Interface** when creating the IKE.
- Under PPPoE fast mode, select “ADSL_HIGHSPEED” as the outgoing interface.

📖 Note:

For details on configuring filter rules, please refer to “4.2 Managing Filter Rules”. For details on IPsec VPN configurations, please refer to “6.2 Configuring IPsec VPN Connections”.

CONFIGURATION PROCEDURE – COMMON MODE

Step 1 Connect the network cable for PPPoE access to the MGT1 port.

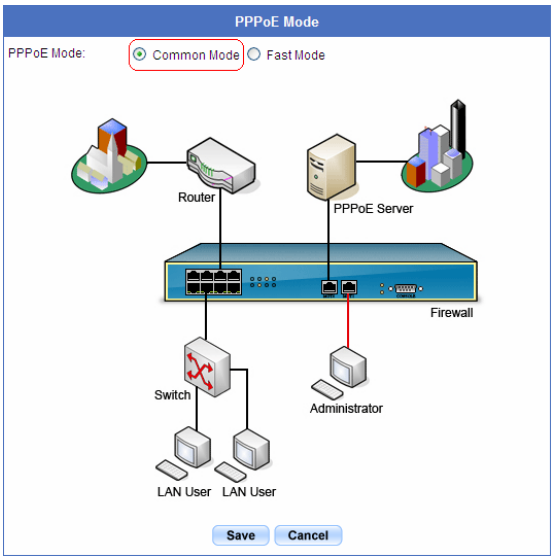
Step 2 Login to SifoWorks via a read/write administrator account.

Step 3 Select PPPoE mode

1. From the left menu bar, select **"Advance > PPPoE Mode"**.
2. Select the "Common Mode".

Note:

Please jump to step 4 if SifoWorks is already working in PPPoE common mode.



3. Click **[Save]** to save the settings. SifoWorks will automatically restart. Please re-login to the system once the system reboots.

Step 4 Establish the PPPoE connection

1. From the left menu bar, select **"Network > PPPoE Setting"**.
2. In the "*Configuration*" tab, enter the **User Name** and **Password** used to authenticate SifoWorks when establishing the connection.

Note:

You can also select a schedule/weekly schedule object in the **Schedule** drop down menu. The system will attempt to establish / disconnect the PPPoE connection according to the schedule automatically.

3. Click **[Save]** to save the settings.
4. Click **[Next>]** to view the "*Connection*" tab. Here, you can:
   - Click **[Start]**. The system will begin to dial the connection. Once connected, you can view various connection information such as IP address, gateway etc. from the "*Monitor*" tab.
   - Click **[Stop]** to disconnect the connection.

CONFIGURATION PROCEDURE – FAST MODE

Step 1 Connect the network cable for PPPoE access to the MGT1 port.

Step 2 Connect a network cable from MGT0 to FE7.

Step 3 From an available data port (FE0 – FE6), login to SifoWorks using a read/write administrator account.

Step 4 Select the PPPoE mode

1. From the left menu bar, select **"Advance > PPPoE Mode"**.
2. Select "Fast Mode".

📖 Note:

Please jump to step 5 if SifoWorks is already working in PPPoE fast mode.

3. Click **[Save]** to save the configuration. SifoWorks will automatically restart. Please re-login to the system once the system reboots.

Step 5 Establish the PPPoE connection

1. From the left menu bar, select **"Network > PPPoE Setting"**.
2. In the "*Configuration*" tab, enter the **User Name** and **Password** used to authenticate SifoWorks when establishing the connection.

📖 Note:

You can also select a schedule/weekly schedule object in the **Schedule** drop down menu. The system will attempt to establish / disconnect the PPPoE connection according to the schedule automatically.

3. Click **[Save]** to save the settings.
4. Click **[Next>]** to view the "*Connection*" tab. Here, you can:
   - Click **[Start]**. The system will begin to dial the connection. Once connected, you can view various connection information such as IP address, gateway etc. from the "*Monitor*" tab.
   - Click **[Stop]** to disconnect the connection.

3.6 Specifying DNS Servers

To specify the IP addresses of DNS servers to be connected to SifoWorks so that the system is equipped with domain name resolution capability.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Network > DNS Setting"**.

Step 3 Enter the IP address of the **Primary DNS** server.

Step 4 Enter the IP address of the **Secondary DNS** server.

Step 5 Click **[Save]** to save the configuration.

3.7 Configuring DDNS

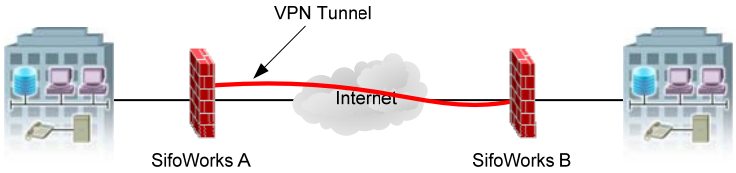
You can connect SifoWorks to a DDNS (Dynamic Domain Name System) server to provide the DDNS service. This allows users to establish dynamic VPN connections under the PPPoE access method.

If SifoWorks connects to the Internet via PPPoE, the IP address assigned to the system changes dynamically each time it establishes a PPPoE connection. The DDNS service is thus used to resolve static domain names to dynamic IP addresses.

DDNS service requires cooperation between the server and the client. Each time the client connects to the Internet and receives a new IP, the client will inform the DNS server to update the domain name resolution database. While this client is online, other Internet users accessing this domain name can thus be pointed to the correct client IP address.

Dynamic VPN connections can be established once DDNS is configured. For example, in the figure below, SifoWorks A accesses the Internet via a static IP. SifoWorks B accesses the Internet via PPPoE. Therefore:

- Without DDNS, SifoWorks A will not be able to obtain the IP address of SifoWorks B. Thus, VPN connections can only be established if initiated by SifoWorks B.
- If DDNS is set up, SifoWorks A can obtain the IP address of SifoWorks B via domain name resolution. Hence, either device will be able to establish VPN connection with the other.



CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **"Network > DDNS Setting"**.

Step 3 In the "*DDNS Configuration*" tab displayed, check to **Enable DDNS**.

Step 4 From the **Service provider** drop down menu, select the DDNS service provider. Enter your registered **User Name**, **Password** and the device's **Domain Name**.

DDNS service provider includes: www.3322.org and www.dhs.org.

Step 5 Select the **Interface** used for DDNS from the drop down menu.

If SifoWorks is using PPPoE fast mode to access the Internet, please select "ADSL_HIGHSPEED" in the **Interface Name** parameter.

Step 6 Click **[Save]** to save the settings.

Step 7 (Optional) You can click the "*DDNS Status*" tab to view DDNS related information.

REFERENCE

Related tasks include:

- 3.5 Configuring PPPoE Connections
- 6.2 Configuring IPsec VPN Connections

3.8 Managing IP-MAC Bindings

Binding IP addresses to specific MAC addresses reduces security risks as users will only be able to access the network via specific host machines. Some concept explanations are detailed below.

MAC Address

Also known as hardware address or link address, MAC address refers to the physical address of a network card. MAC address is written into the network card's EPROM (Erasable Programmable Read Only Memory) and acts as the identifier of a network card.

IP Spoofing

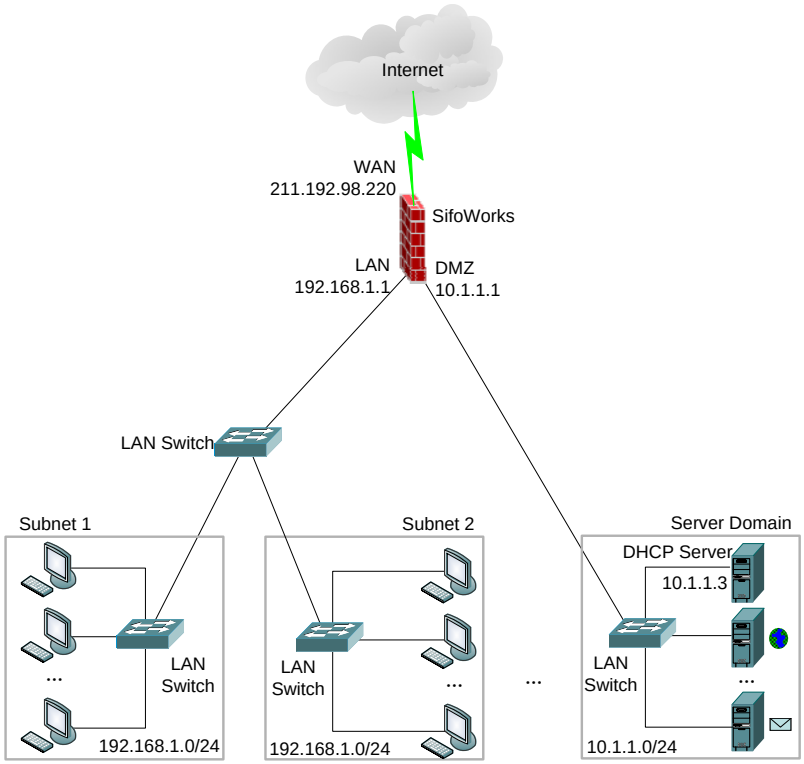
This is a complicated network attack that attempts to access protected hosts illegally. These attack data packets are masqueraded to originate from trusted addresses, thus tricking firewalls and routers into believing that the packets are from trusted networks to gain access illegally.

IP addresses of hosts can be easily modified. On the other hand, MAC addresses are written into the network card itself and are thus difficult to modify. Hence, binding IP addresses to MAC addresses can help to reduce IP spoofing attacks.

When SifoWorks receives a data packet, it will first check the packet's source IP and MAC addresses against the IP-MAC binding records in its list. Users can also configure host policies to determine whether to accept data packets from hosts not included in the ARP tables.

APPLICATION EXAMPLE

In the network topology shown below, we want to bind the IP addresses of all users in the LAN network.



In this network,

- Range of IP addresses to be binded is 192.168.1.10 – 192.168.1.60
- Drop all accesses from other IP addresses
- Enable MAC binding
- Enable the system to update neighbor's cache with an update interval of 10 seconds.

The configuration procedure is as follows:

Step 1 Collect the corresponding MAC addresses for each of the IP addresses in the range 192.168.1.10 – 192.168.1.60 and record it in a table similar to the one below.

Note:

SifoWorks automatically adds all static ARP entries into the IP-MAC binding list and all dynamic ARP entries into the IP-MAC dynamic cache list. You can select to add IP-MAC pairs in the dynamic cache to the IP-MAC binding list.

For more information on ARP, please refer to "3.9 Managing the ARP Tables".

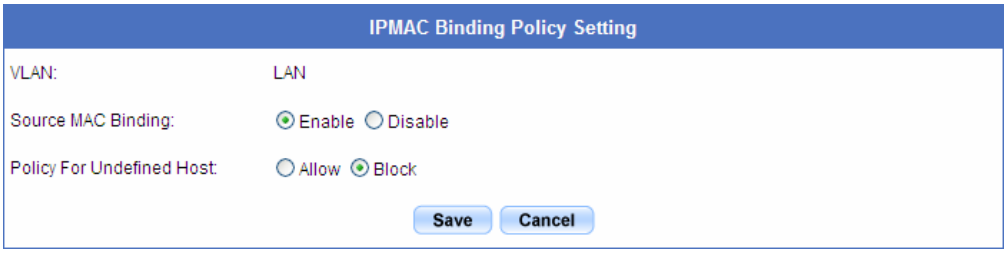
IP Address	MAC Address
192.168.1.10	00:14:22:B0:7A:9E
192.168.1.11	00:1C:C3:44:9D:20
...	...
...	...
192.168.1.60	__:__:__:__:__:__

Step 2 Login to SifoWorks via a read/write administrator account.

Step 3 From the left menu bar, select **"Network > IP-MAC Binding"**.

Step 4 Configure the IP-MAC binding settings

1. From the displayed list ("*IP-MAC Binding Setting*" tab), click the icon corresponding to the VLAN representing your LAN network.
2. In the interface displayed, select to "Enable" **Source MAC Binding**. "Block" data packets from **Undefined Hosts**.



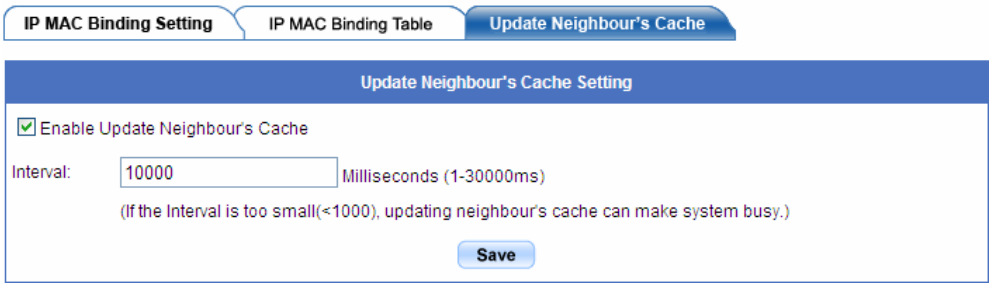
3. Click **[Save]** to save the settings.

Step 5 Set up the static IP-MAC bindings

1. Return to the previous interface and select the *"IP MAC Binding Table"* tab to view the current list of IP-MAC bindings.
2. From this list, click **[Add New IP-MAC Item]**.
3. In the configuration interface displayed, enter **IP** as "192.168.1.10" and "00:14:22:B0:7A:9B" in the **MAC** field.
4. Click **[Add new IP MAC Binding+]** to add a new IP-MAC pair.
5. Repeat step 3 and enter the IP-MAC pair for IP "192.168.1.11".
6. Repeat steps 4-5 to add all IP-MAC binding pairs according to your IP-MAC information table created in step 1 above.
7. Click **[OK]** to save the configuration.

Step 6 Enable the Update Neighbor's Cache function

1. Return to the **"Network > IP-MAC Binding"** interface and select the *"Update Neighbor's Cache"* tab.
2. Select to **Enable** the update neighbor's cache function at an **Interval** of "10000" milliseconds.



3. Click **[Save]** to save the configuration.

3.9 Managing the ARP Tables

This operation helps you to manage your static and dynamic ARP tables, reducing security risks due to ARP spoofing or IP spoofing. The concepts relating to this function includes the following.

ARP (Address Resolution Protocol)

Address resolution protocol is used to map an IP address to a MAC address during the transmission of data packets.

ARP Cache

An ARP cache records IP to MAC mappings in a temporary cache in all hosts with the TCP/IP protocol installed.

Example: Host A sends data to host B. Before sending a packet, host A checks its own ARP table for host B's IP address. If found, host A obtains host B's MAC address from the ARP table; otherwise, host A sends a broadcast packet through the network to obtain host B's MAC address and updates it's own ARP cache accordingly.

ARP cache utilizes an aging mechanism. Any entries that were unused for a period of time will be removed from the ARP cache.

Dynamic ARP

Dynamic ARP entries are generated during successful address resolutions. These entries will be automatically removed from the host after a period of time.

SifoWorks' dynamic ARP table lists all dynamic ARP entries.

Static ARP

These are ARP entries manually added into the system. Static ARP entries will not be automatically deleted by the system. Hence, storing static ARP entries can reduce security risks due to ARP spoof or IP spoof attacks.

You can manually add static ARP into the system from the "**Network > ARP Setting**" interface. You can also move selected dynamic ARP entries to the static ARP table.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Network > ARP Setting"** to view the ARP tables.

Step 3 From this interface, you can:

- Click **[Add New Static ARP]** to display the "Static ARP Setting" interface. Enter the IP and MAC addresses and click **[OK]** to save the static ARP entry.
- Click the "*Dynamic ARP*" tab to view the dynamic ARP table. Select ARP entries from this table and click **[Set to Static]** to add the selected dynamic ARP mappings to the static ARP table.

Chapter

4

Firewall Rule Management

This chapter includes the following sections

- Overview

  Briefly explains the various types of firewall rules including filter rules, local rules and content filtering rules.

- Managing Filter Rules

  Describes, in detail, how to define filter rules according to your company's actual requirements to accurately control the flow of traffic between the various data ports.

- Managing Local Rules

  Explains how to configure local rules to control accesses to the SifoWorks system (for configuration and maintenance) via data ports.

- Managing Content Filtering Rules

  Detailed explanation on how to define content filtering rules according to your company's requirements, controlling transmitted application layer packets (including HTTP, FTP and Email packets). This section also explains the set of special characters that can be used when defining in the content filtering function.

We recommend reading this chapter if you want to manage the system's firewall rules.

4.1 Overview

SifoWorks define 3 types of firewall access control rules.

Filter Rules

These rules determine if packets are allowed to pass through the firewall. Each filter rule:

- Identifies the incoming and outgoing interfaces of packets based on virtual port and VLAN
- Identifies the data flow according to the packet's IP address, authentication user, service or MAC address etc.
- Specify whether to accept or drop specific traffic using an **Action** parameter.
- Prevents illegal traffic by enabling an optional intelligent recognized protocol function.
- Can be configured with content filter rules to filter the contents of the traffic. This is only configurable if **Action** is "accept".
- Is able to enable QoS to control the guaranteed and maximum bandwidth allocated to each incoming and outgoing data port. This is only configurable if **Action** is "accept".
- Is able to limit the number of maximum concurrent connections for each host or network segment. This is only configurable if **Action** is "accept".
- Can be configured with a schedule object, specifying when this rule is effective. For example, a rule can be set up to be effective only between 1pm – 3pm every Monday.

Local Rules

These rules allow administrators to configure and manage the SifoWorks system via the network ports. Local rules:

- Identify the incoming interface through virtual port and VLAN configurations.
- Identify the data flow based on IP address, service and MAC address.
- Permits or denies traffic from passing through the firewall through an **Action** parameter.
- Can limit the maximum number of concurrent connections for each host or network segment. This is only configurable if the rule's **Action** is "accept".
- Can be configured with a schedule object, specifying when this rule is effective. For example, a rule can be set up to be effective only between 1pm – 3pm every Monday.

Content Filtering Rules

Content filter rules determine if an application layer data packet (HTTP, FTP and Email protocols) is allowed to pass through the firewall. Content filter rules include URL filtering, email filtering, FTP filtering and keyword filtering.

Content filter rules will only be effective when they are applied on filter rules.

Before managing any type of firewall rules, please ensure that your SifoWorks system has been successfully connected to your network by completing the basic network configuration operation. Please refer to "3.2 Setting up the Basic Network Settings" for details.

4.2 Managing Filter Rules

The SifoWorks system uses a firewall rule list containing a series of firewall rules. When a packet arrives at the SifoWorks device, the system matches the packet against this list in a top down fashion. When a particular rule matches the packet, the system will either:

- Immediately allow the packet to pass through the firewall if the action of the matching rule is "accept";
- Immediately discards the packet if the action of the matching rule is "drop".

Therefore, the positioning of rules in the list affects both the network operation and system's performance. You should add and adjust the filter rule list according to the actual network requirements.

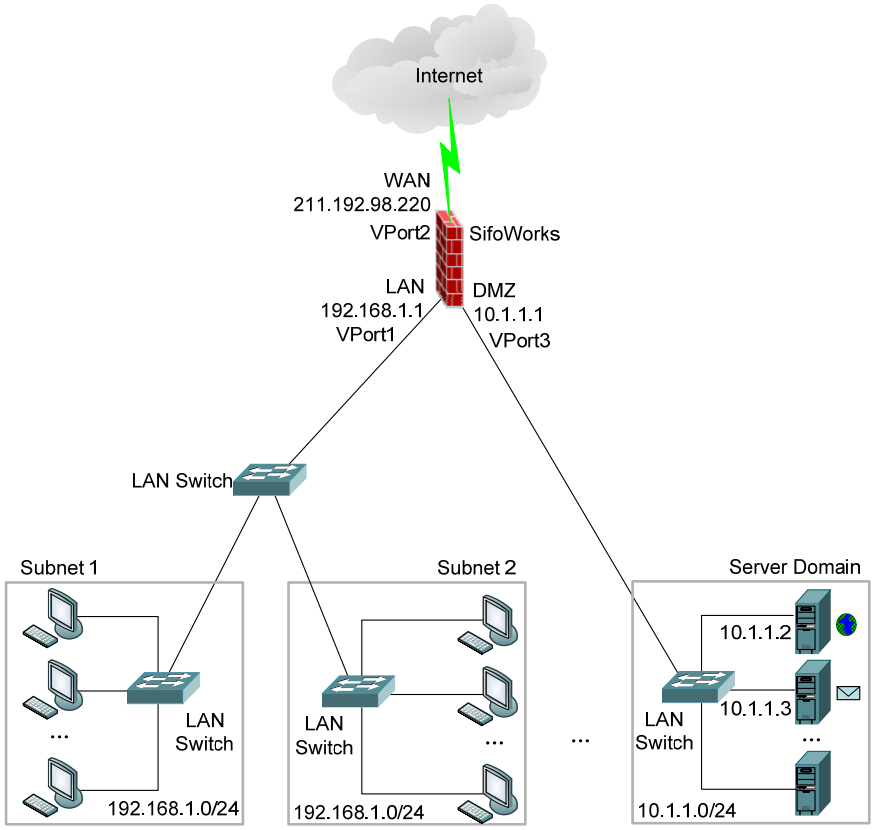
Generally, you are recommended to configure filter rules as follows:

1. Add "accept" filter rules for all external to internal accesses.
2. Add "accept" filter rules for all internal to external accesses.

Please first set up content filtering rules and QoS settings if you intend to enable these options in any of your filter rules. Please refer to "4.4 Managing Content Filtering Rules" and "7.2 Setting Up QoS Services" for information on setting up content filtering rules and QoS respectively.

APPLICATION EXAMPLE 1 – INTELLIGENT PROTOCOL RECOGNITION

The network topology used in this example is shown below.



A system administrator wants to set up SifoWorks such that it is able to enforce the following access control:

- All external users in the WAN domain can access the web server in DMZ using the HTTP service
- All internal LAN users can access the web server in DMZ via the HTTP service
- All internal LAN users can access the SMTP server in DMZ via the SMTP service
- Enable intelligent recognized protocol to prevent illegal data traffic
- Log packets that matches any of these filter rules for analysis and future tracking purposes

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Firewall > Filter Rule"** to view the current list of filter rules.

Step 3 Add the filter rule to allow WAN users access to the web server.

1. Click **[Add New Filter Rule]** to display the configuration interface for adding a new filter rule.
2. Select **Action** as "Accept". Click **Advanced** to display the advanced options and select to enable **Log** for this rule.
3. Click **[Next>]** to display the "*Match*" tab interface and configure as follows:

   Virtual Port From: VPort2

   Virtual Port To: VPort3

   VLAN From: WAN

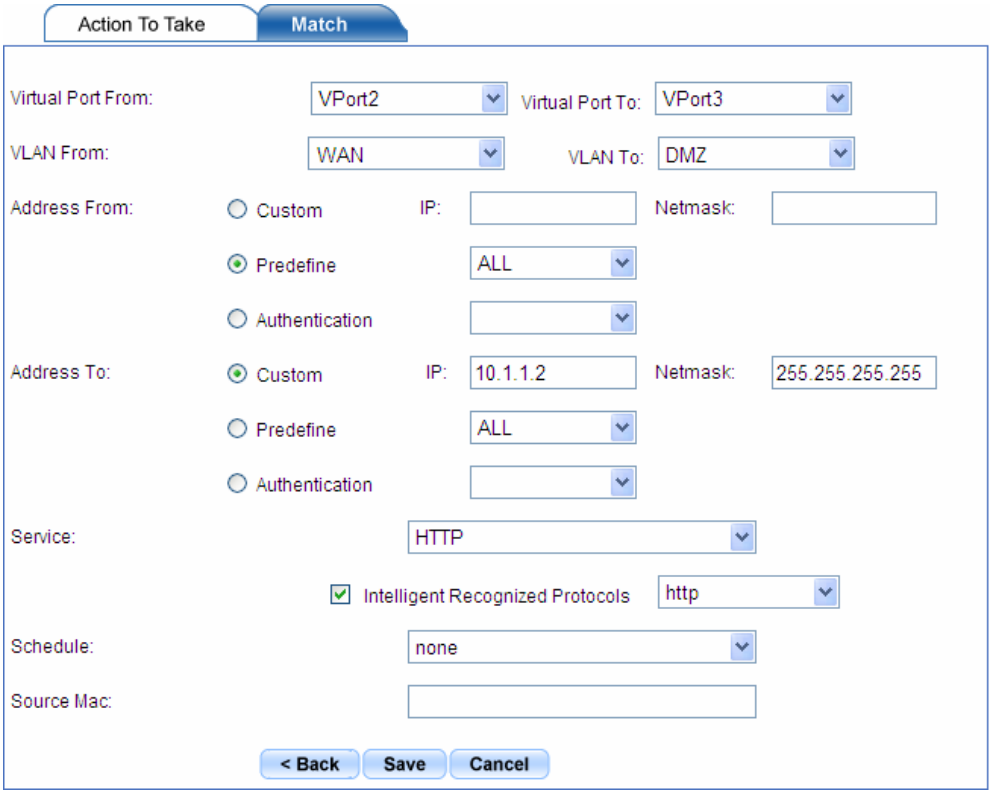
   VLAN To: DMZ

   Address From/Predefine: All

   Address To/Custom(IP/Netmask): 10.1.1.2/255.255.255.255

   Service: HTTP

4. Select to enable the **Intelligent Recognized Protocol** function and select "http" from the drop down menu. The figure below shows the above configurations.



5. Click **[Save]** to save the new filter rule and return to the filter rule list.

Step 4 Add a filter rule to allow LAN users to access the web server.

1. Click **[Add New Filter Rule]** to display the configuration interface to add a new filter rule.
2. Select **Action** as "Accept". Click **Advanced** to display the advanced options and select to enable **Log** for this rule.
3. Click **[Next>]** to view the "*Match*" tab interface. Configure as follows:

   Virtual Port From: VPort1

   Virtual Port To: VPort3

   VLAN From: LAN

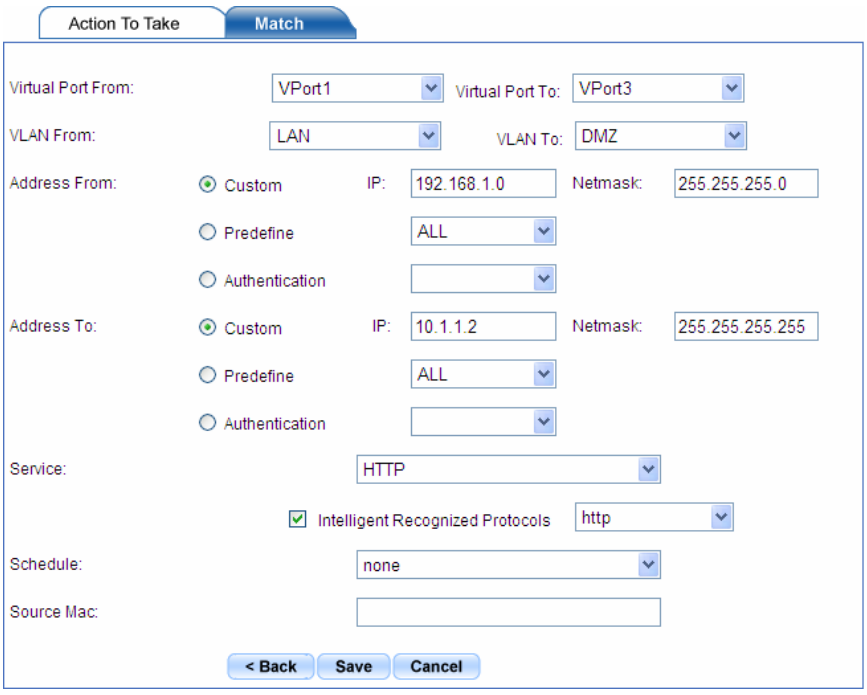
   VLAN To: DMZ

   Address From/Custom(IP/Netmask): 192.168.1.0/255.255.255.0

   Address To/Custom(IP/Netmask): 10.1.1.2/255.255.255.255

   Service: HTTP

4. Select to enable the **Intelligent Recognized Protocol** function and select "http" from the drop down menu. The figure below shows the above configurations.



5. Click **[Save]** to save this filter rule and return to the filter rule list.

Step 5 Add a filter rule to allow LAN users to access the SMTP mail server.

1. Click **[Add New Filter Rule]** to display the configuration interface to add a new filter rule.
2. Select **Action** as "Accept". Click **Advanced** to display the advanced options and select to enable **Log** for this rule.
3. Click **[Next>]** to view the "*Match*" tab interface. Configure as follows:

   Virtual Port From: VPort1

   Virtual Port To: VPort3

   VLAN From: LAN

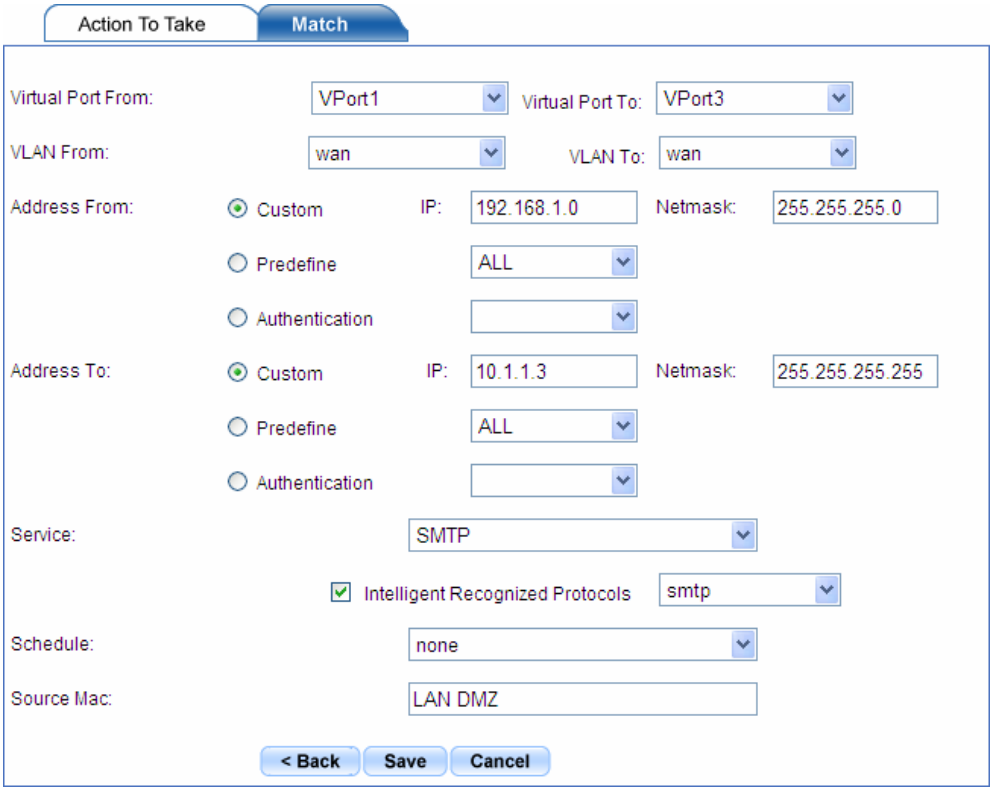
   VLAN To: DMZ

   Address From/Custom(IP/Netmask): 192.168.1.0/255.255.255.0

   Address To/Custom(IP/Netmask): 10.1.1.3/255.255.255.255

   Service: SMTP

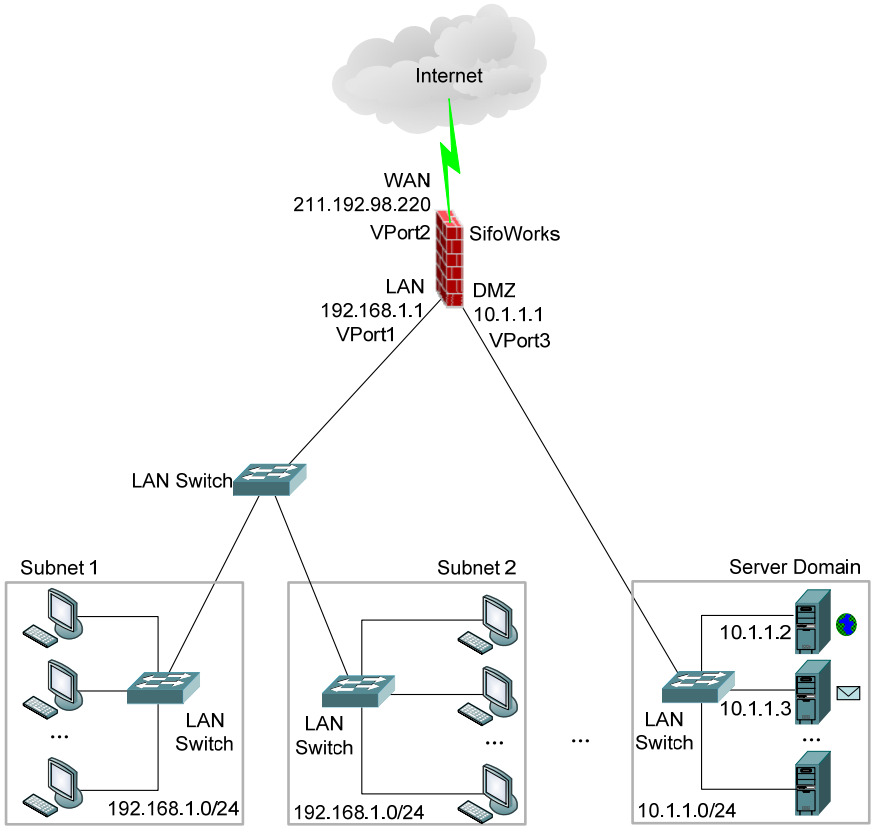
4. Select to enable the **Intelligent Recognized Protocol** function and select "smtp" from the drop down menu. The figure below shows the above configurations.



5. Click **[Save]** to save this filter rule and return to the filter rule list.

APPLICATION EXAMPLE 2 – AAA AUTHENTICATION

The network topology used in this example is shown below.



A system administrator wants to set up SifoWorks such that all users in the subnet 192.168.1.0/255.255.255.0 must be authenticated before they can access external networks via HTTP.

The users in this subnet and their authentication information are tabulated in a table similar to the one below:

User Name	Password
User01	123456
User02	123456
...	...

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

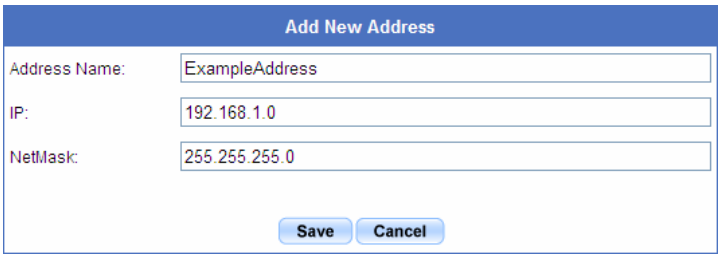
Step 2 Add address object

1. From the left menu bar, select **"Object > Address"**.
2. Click **[Add New Address]**.
3. In the "Add New Address" interface, configure as follows:

   Address Name: ExampleAddress

   IP: 192.168.1.0

   NetMask: 255.255.255.0



4. Click **[Save]** to save the address object.

Step 3 Add authentication users

1. From the left menu bar, select **"System > Auth User"**.
2. Click **[Add New Auth User]**.
3. In the "Add New AuthUser" interface, enter:

   User Name: User01

   AuthServer: LOCAL

   User Attribute: Filterrule

   status: Enable

   Password: 123456

   Confirm Password: 123456

4. Click **[Save]** to save the authentication user.
5. Repeat steps 2-4 to add the other authentication users.

Index	Name	Attribute	AuthServer	Status	Operation
0	user01	FilterRule	LOCAL	enable	
1	user02	FilterRule	LOCAL	enable	

Step 4 Add authentication user group

1. From the left menu bar, select **"System > Auth Group"**.
2. Click **[Add New Auth User Group]**.
3. Enter the **Auth Group Name** "ExampleGroup". Check the "Filterrule" **Attribute**.
4. Select all authentication users added in step 3 above from the "Available Users" list and click ---> to assign users to this group.
5. Click **[Save]** to save the authentication user group.

Index	name	attribute	description	Operation
0	ExampleGroup	FilterRule		

Step 5 Add authentication address

1. From the left menu bar, select **"System > Auth Address"**.
2. At the bottom of the list displayed, click **[Add New Auth Address]**.
3. In the "Add New Auth Address" interface, configure as follows:

   Name: ExampleAuthAddress

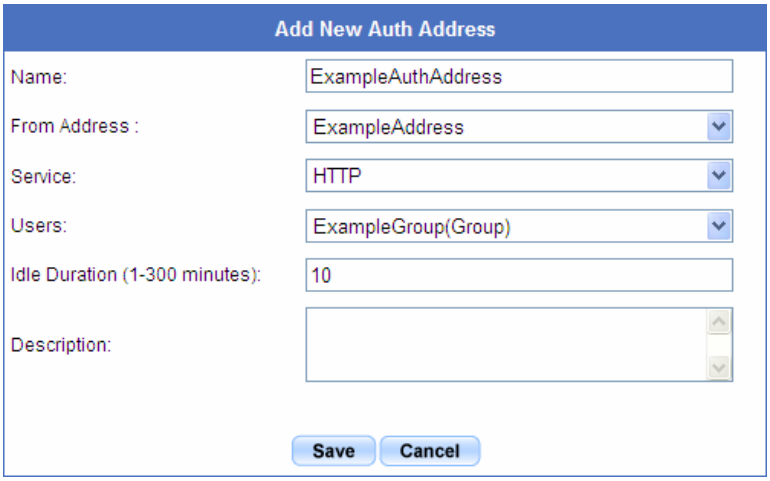
   From Address: ExampleAddress

   Service: HTTP

   Users: ExampleGroup

Note:

Idle Duration refers to the timeout value of users' access to the Internet via SifoWorks after authentication. If no Internet access via SifoWorks was made by the authenticated user for this period of time, the system will prompt the user to re-authenticate himself.



4. Click **[Save]** to save the new authentication address.

Step 6 (Optional) Customize authentication interface

1. From the left menu bar, select **"System > Auth Server"**.
2. Click the "*Banner*" tab to customize the authentication interface.
3. Here, enter the various messages to be displayed on the user authentication interface.
4. Click **[Save]** to save the settings.

Step 7 Add filter rule

1. From the left menu bar, select **"Firewall > Filter Rule"**.
2. Click **[Add New Filter Rule]** to view the filter rule addition interface.
3. Select **Action** as "Accept". Click **Advanced** to display the advanced options and select to enable **Log** for this rule.
4. Click **[Next>]** to navigate to the "*Match*" tab. Here, configure:

   Virtual Port From: VPort1

   Virtual Port To: VPort2

   VLAN From: LAN

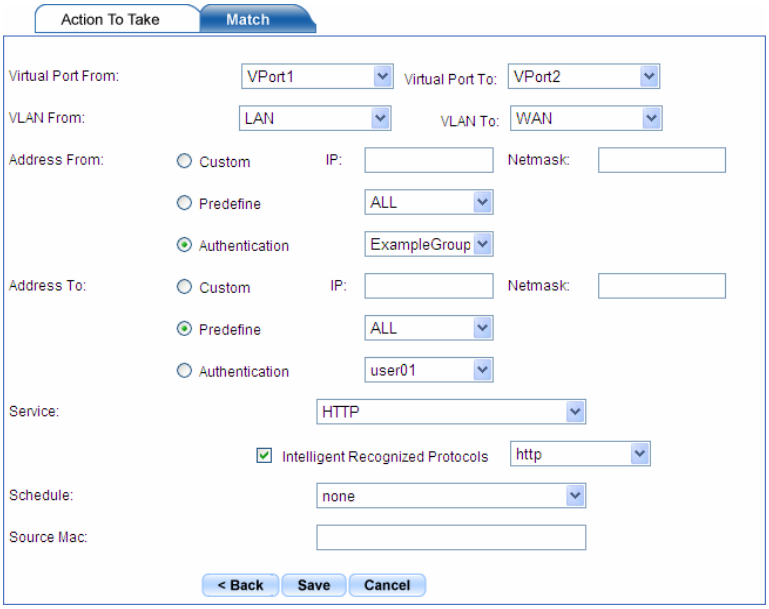
   VLAN To: WAN

   Address From / Authentication: ExampleGroup(Group)

   Address To / Predefine: ALL

   Service: HTTP

5. Select to enable the **Intelligent Recognized Protocol** function and select "http" from the drop down menu. The figure below shows the above configurations.



6. Click **[Save]** to save the filter rule.

Step 8 (Optional) Check if the configuration is correct using any of the authentication users.

Note:

If you can execute this step successfully, you have correctly configured the system to meet the necessary requirements. Otherwise, please return to the above steps to check if any errors were made. If the problem persists, please contact O2Security technical support.

1. Using any PC within the 192.168.1.0/255.255.255.0 subnet and access the authentication interface.

   The authentication interface for authentication users uses the same IP address as that of SifoWorks management UI. However, the HTTP protocol is used instead. For example, if SifoWorks management UI address is “https://192.168.1.1/”, the address of the authentication interface will be “http://192.168.1.1/”.

Note:

For hosts in subnets that requires authentication before HTTP accesses is allowed, entering any Internet address into the web browser will automatically direct the user to the system’s authentication interface. Upon successful authentication, the user will then be automatically directed to the entered web address.

2. In the authentication interface, enter the **UserName** and **Password**.

3. Click **[Auth]**. SifoWorks will attempt to authenticate the user. A success message will be displayed if the authentication is successful.
4. Access other web pages to check that the filter rule is correctly set up.

REFERENCE

Intelligent Protocol Recognition

SifoWorks intelligent recognized protocol function supports the following types of protocols:

- HTTP, FTP, SOCKS, SSH, Telnet
- TFTP, VNC, RTSP, H.323, SIP, IM_HTTP_Proxy
- SMTP, POP3, IMAP
- AIM, MSNMessenger, QQ, YahooMessenger, POPO
- Bittorrent, Edonkey, Mute, Foxy, Kugoo, Xunlei

Additional information on the above protocols:

- Emule and BT
  - SifoWorks is able to block data traffic and apply QoS on non-encrypted data packets. However, QoS cannot be applied on encrypted packets. Hence, if the is an excessive amount of encrypted packets, we recommend directly blocking Emule and BT traffic.
  - SifoWorks blocks Emule and BT traffic by preventing the client from obtaining information of seeders from the server. Hence, the system is unable to block Emule or BT download traffic if seeder information has already been obtained.
- Xunlei
  - Xunlei downloads uses multiple protocols such as FTP, HTTP, BT and Emule etc. Hence, for HTTP or FTP Xunlei downloads, we recommend using a combination of FTP and Xunlei protocols to enforce QoS.
  - For Xunlei downloads using BT and Emule, you should not select Xunlei when creating the filter rule. Select BT or Emule instead.

AAA Authentication

The AAA module supports up to 1024 local authentication users and 64 authentication groups. Each group can contain up to 512 members. Group members can be:

- Local users
- External authentication servers
- Users of external authentication servers that are mapped locally

  This is used if only a subset of the users on the external authentication server must be authenticated. To add these users, navigate to the **"System > Auth User > [Add New Auth User]"** interface. Enter the user name and select the corresponding authentication server. You need not enter password information for these users.

SifoWorks process filter rules assigned with authentication users in two phases:

- Authentication phase

  The user enters his authentication information in the authentication interface. Upon successful authentication, the user will be listed in the "Online User" list.

- Authorization phase

  The system matches the online user information with filter rules to assign user authorization. If authentication is required for both source and destination addresses (that is, "Authentication" is selected for both **Address To** and **Address From** parameters), both users (source and destination hosts) must be authenticated before the packet will match the filter rule.

Related Tasks

Operations related to filter rules include:

- 4.4 Managing Content Filtering Rules
- 7.2 Setting Up QoS Services
- 7.6 Upgrade Intelligent Recognized Protocols (IRP)
- 10.2 Monitoring Sessions and Online Users

MAINTENANCE RECOMMENDATIONS

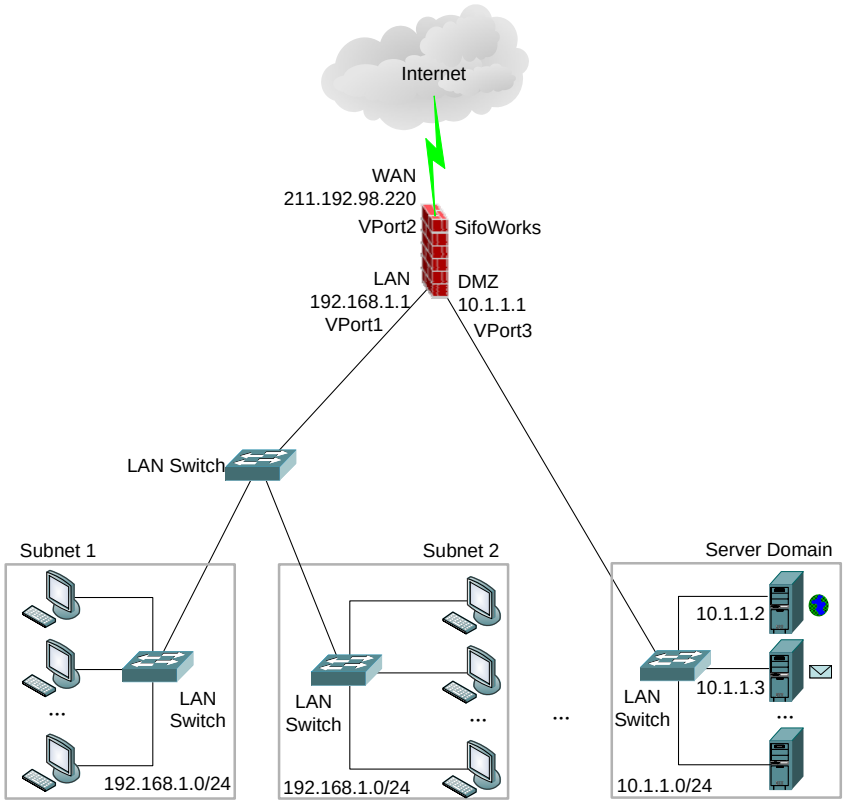
You are recommended to export the current filter rule list (**[Export Rules]** button) to a locally saved file before modifying the filter rule list.

4.3 Managing Local Rules

Local rules allow you to control accesses to the SifoWorks system via data ports. Local rules configuration is not recommended if you do not require access to the SifoWorks system via data ports.

APPLICATION EXAMPLE

The following network topology is used in this example.



A SifoWorks system administrator wants to be able to manage SifoWorks via a workstation in the LAN domain. The IP address of this workstation is 192.168.1.10. SifoWorks' administrative IP is 192.168.1.1.

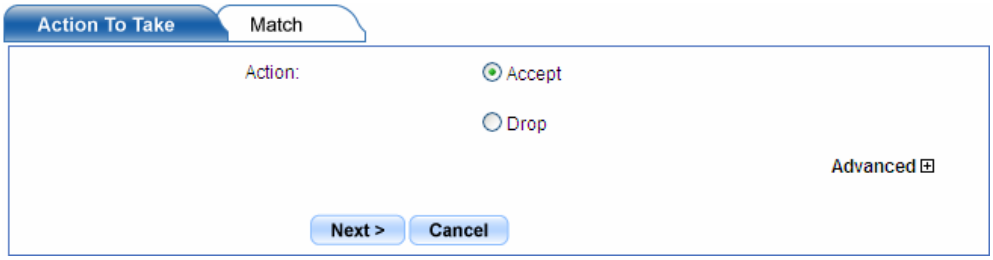
The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Firewall > Local Rule"**.

Step 3 The local rule list will be displayed. From the bottom of this list, click **[Add New Local Rule]**.

Step 4 Select the rule's **Action** as "Accept".



Step 5 Click **[Next>]** to view the "*Match*" tab interface and configure as follows:

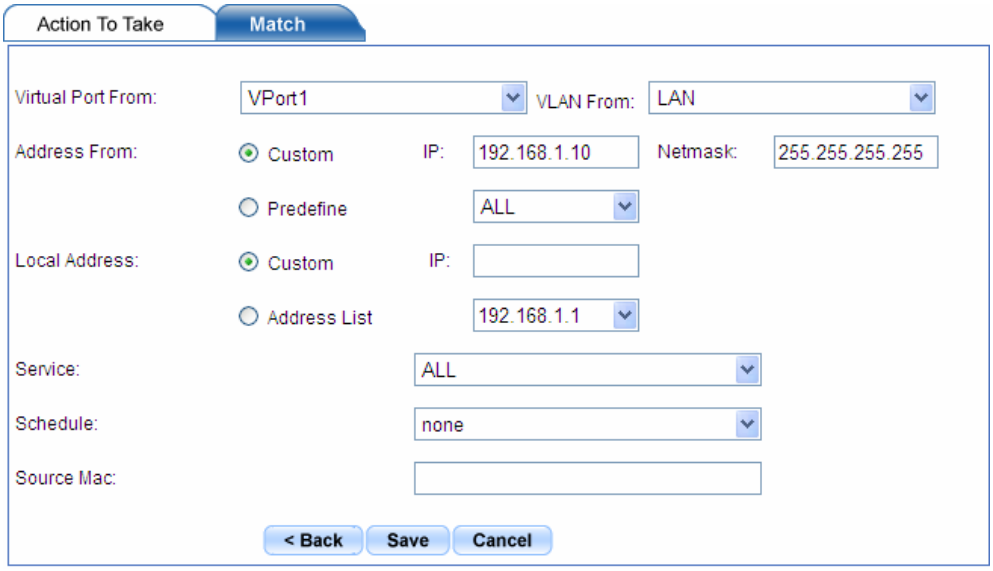
Virtual Port From: VPort1

VLAN From: LAN

Address From/Custom(IP/Netmask):192.168.1.10/255.255.255.255

Local Address/Address List: 192.168.1.1

Service: All



Step 6 Click **[Save]** to save the local rule.

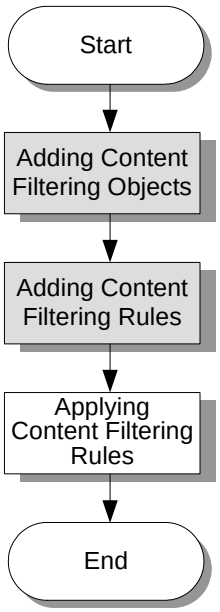
4.4 Managing Content Filtering Rules

Content filtering rules filter contents of application data packets. For more explanation on content filtering rules, please refer to "4.1 Overview".

You can define content filtering rules according to your network requirements. Note, however, that content filter rules will only be effective when it is selected as part of a packet filter rule. "4.2 Managing Filter Rules" contains more information on managing filter rules.

CONFIGURATION FLOWCHART

The following flowchart lists the steps to successfully set up content filtering in the SifoWorks system.



Each step is briefly described in the table below.

Operation	Description
Adding Content Filtering Objects	Add the objects to be used in the content filtering rules. This can be URL, mail or keyword objects.
Adding Content Filtering Rules	Add the content filtering rules using the content filtering objects.
Applying Content Filtering Rules	Apply the content filtering rule within an "accept" **Action** filter rule. For detailed information on managing filter rules, please refer to "4.2 Managing Filter Rules".

APPLICATION EXAMPLE 1 – WEB CONTENT FILTERING

According to the company's policies, the system administrator wants to set up SifoWorks to restrict accesses to the following URLs by hosts in specific subnets.

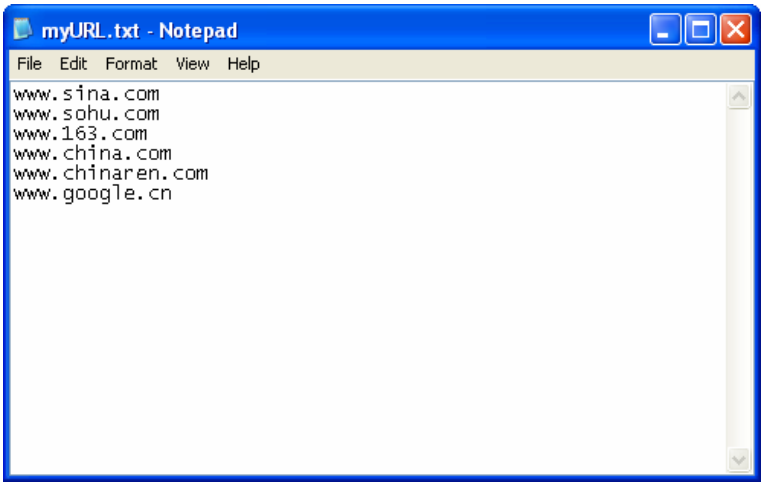
- www.sina.com
- www.sohu.com
- www.163.com
- www.china.com
- www.chinaren.com
- www.google.cn

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Add a URL content filtering object

1. From the left menu bar, select **"Object > Content Filtering Obj"**
2. Using a text editor, such as Notepad, create a text file containing a list of all the above URLs. Save the file as "myURL.txt" as shown in the figure below.

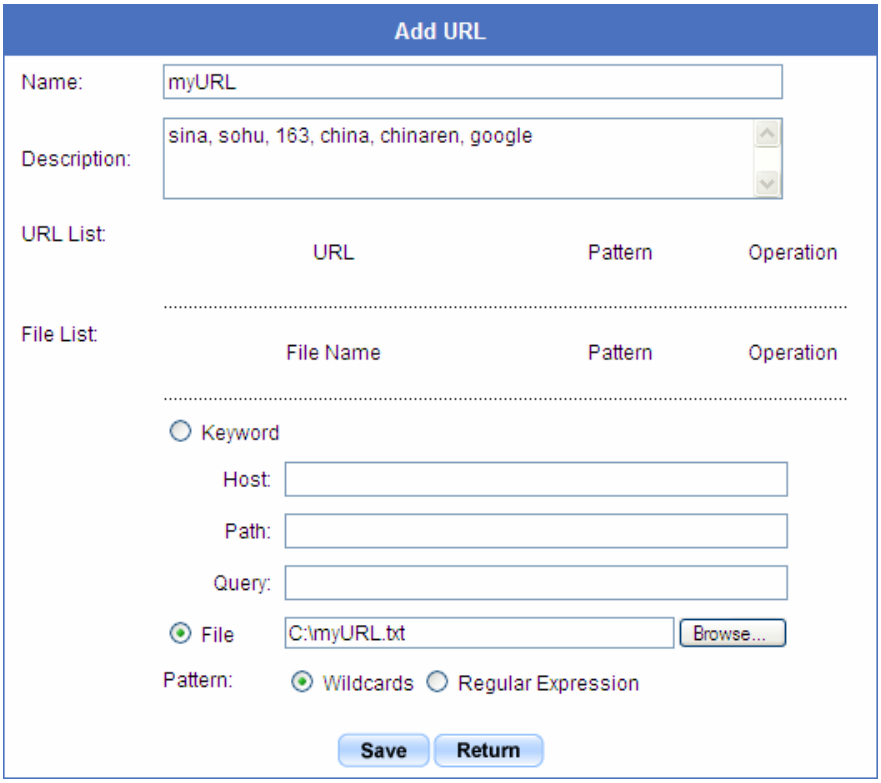


3. Back in SifoWorks' URL content filtering object list interface, click **[Add URL Obj]**.
4. The "Add URL" interface will be displayed. Configure as follows:

   Name: myURL

   Description: sina, sohu, 163, china, chinaren, google

5. Select **File**. Click **[Browse…]** and select the text file containing the list of URLs created earlier ("myURL.txt").



6. Click **[Save]**. The interface will refresh to display a new entry in the **File List**.
7. Click **[Return]** to save this URL object and return to the URL content filtering object list.

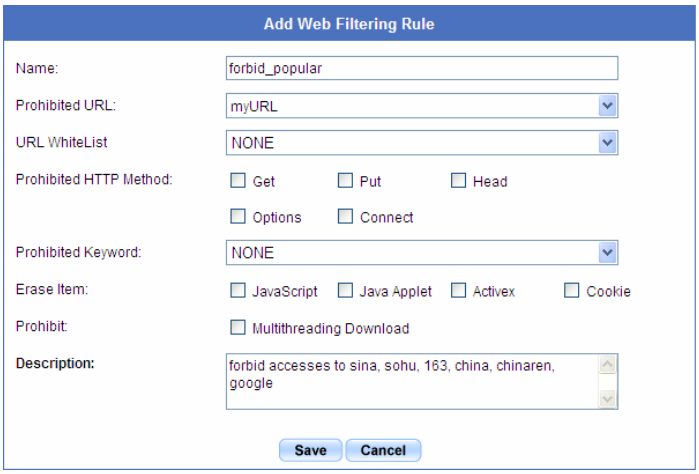
Step 3 Add a web content filtering rule

1. From the left menu bar, select **"Firewall > Content Filtering"**. The "*Web Filter*" tab interface will be displayed.
2. Click **[Add Web Filtering]** from the bottom of the web filtering rule list.
3. In the displayed interface, configure:

   Name: forbid_popular

   Prohibited URL: myURL

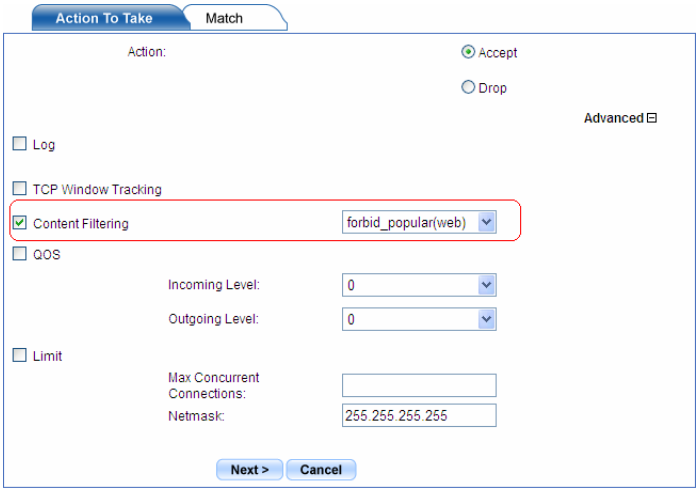
   Description: forbid accesses to sina, sohu, 163, china, chinaren, google



4. Click **[Save]** to save the new rule and return to the web filtering rule list.

Step 4 Add a new filter rule that applies the "forbid_popular" content filtering rule as shown in the figure below.

For information on configuring filter rules, please refer to "4.2 Managing Filter Rules".



APPLICATION EXAMPLE 2 – MAIL CONTENT FILTERING

Based on the enterprise's requirements, a system administrator needs to configure SifoWorks to restrict all mails sent from the mail domains "@sina.com", "@sohu.com" and "@163.com".

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

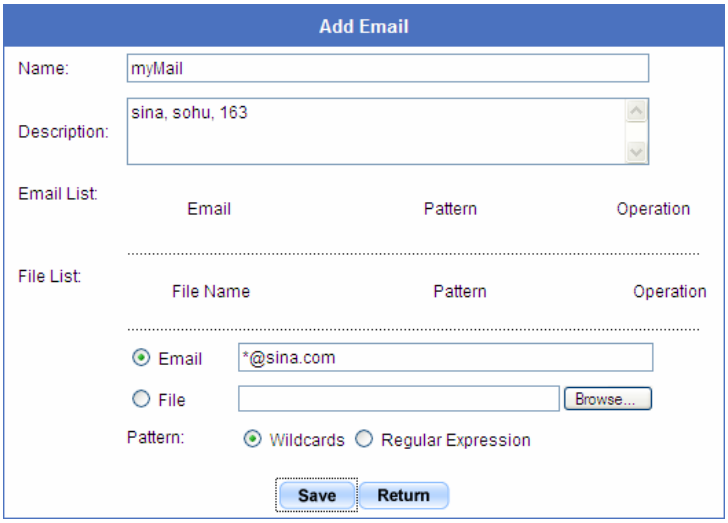
Step 2 Add a new email content filtering object

1. From the left menu bar, select **"Object > Content Filtering Obj"**.
2. Click the "*Email*" tab to view the email content filtering object list.
3. Click **[Add Email Obj]** from the bottom of the list.
4. In the "Add Email" interface, configure:

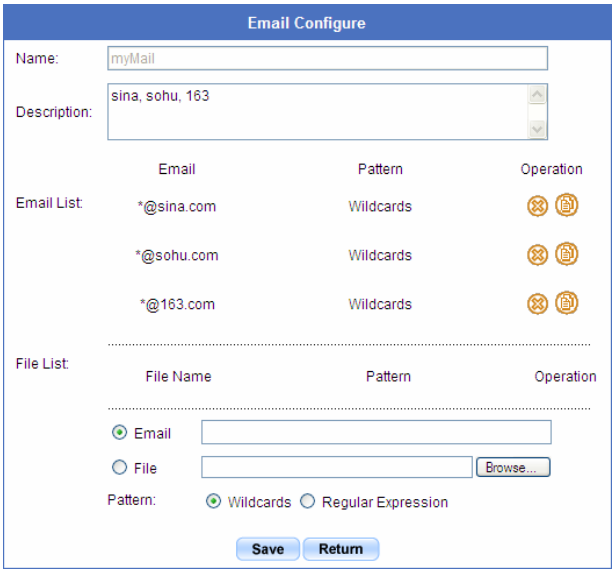
   Name: myMail

   Description: sina, sohu, 163

   Email: *@sina.com



5. Click **[Save]**. This email domain will be added to the **Email List**.
6. Repeat steps 5-6 to add the remaining two email domains (*@sohu.com, *@163.com).



7. Click **[Return]** to save this email object and return to the email content filtering object list.

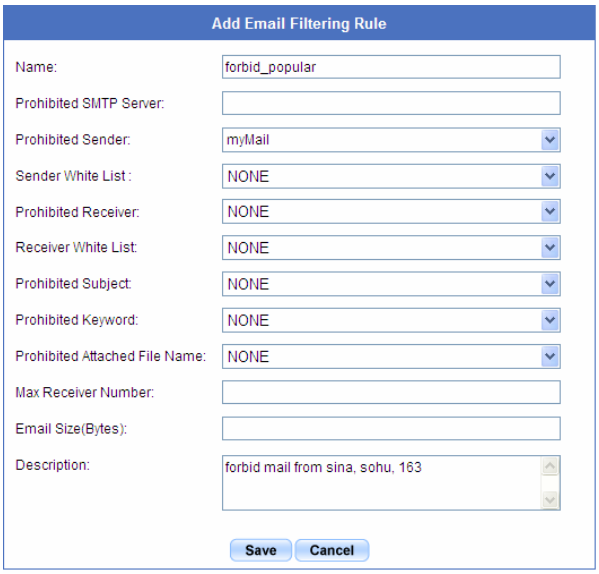
Step 3 Add a mail content filtering rule

1. From the left menu tree, select **"Firewall > Content Filtering"**.
2. Click the *"Email Filter"* tab to display the email content filter rule list.
3. Click **[Add Mail Filtering]** from the bottom of the list.
4. In the "Add Email Filtering Rule" interface displayed, configure:

   Name: forbid_popular

   Prohibited Sender: myMail

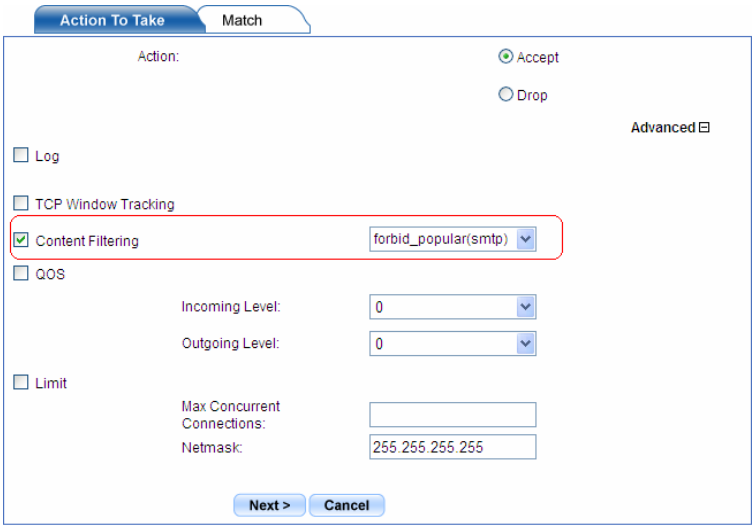
   Description: forbid mail from sina, sohu, 163



5. Click **[Save]** to save the rule and return to the email filtering rule list.

Step 4 Add a new filter rule that applies the “forbid_popular” content filtering rule as shown in the figure below.

For information on configuring filter rules, please refer to “4.2 Managing Filter Rules”.



REFERENCE

Wildcards

SifoWorks supports the use of specific characters as wildcards when specifying content filtering objects. Wildcards include:

- “*”

  Indicates a string of characters (including the space character) of arbitrary length.

  Examples:

  - abc* : Matches any character string beginning with “abc”
  - *abc : matches any character string ending with “abc”
  - *abc* : matches any character string containing “abc”

- “?”

  Indicates any single character.

  Example:

  - abc? : Matches all strings containing 4 characters that begins with “abc”

Special Character Expressions

SifoWorks also supports a set of special character expressions that allows administrators to express complicated contents. These expressions normally made up of a combination of normal and wildcard characters, matching one more multiple character strings.

The table below lists and explains all special character expressions supported by SifoWorks.

Expression	Explanation
\	Indicates that the character is to be matched as it is and not as a special character.
^	Matches the starting position of the character string
$	Matches the ending position of the character string
X(x)*	The characters (enclosed in ()) in front of * can appear 0 or more times. For example, z(o)* will match “z”, “zo” , “zoo” etc.
X(x)+	The characters (enclosed in ()) in front of + can appear one or more times. For example, z(o)+ will match “zo”, “zoo” etc. However, it will not match “z”
X(x)?	The characters (enclosed in ()) in front of ? can appear 0 or 1 time. For example “do(es)?” will match “do” or “does”
.	Matches any single character except “\n”. To match the character set including “\n”, please use “[.\n]”.
(pattern)	Matches “pattern”. All results can be obtained from the generated Matches set. VBScript uses the SubMatches set while Visual Basic Scripting Edition uses the $0…$9 attributes. To match the () brackets, please use \(and \)
A|B	Matches A or B. For example “z|food” matches either z or food. “(z|f)ood” will match either “zood” or “food”
[xyz]	Matches any string containing 1 or more characters from the character set. For example “[abc]” will match “plain” since it contains the character “a”.
[a-z]	Matches any string containing 1 or more characters from this range of characters.
\xN	N is a hexagonal value for the character. For example, “\x41” will match “A” while “\x041” is equivalent to “\x04” and “1”. ASCII values of characters can be used.

Chapter

5

Intrusion Detection and Prevention

This chapter includes the following:

- Overview

  Briefly introduces SifoWorks' Intrusion Detection and Prevention (IDP) module.

- Configuring and Enabling IDP

  Detailed explanation on how to configure and enable IDP.

- Upgrade IDP Rules

  Describes how to upgrade the IDP rule set to the latest version.

Please read this chapter when setting up or modifying the system's IDP function.

5.1 Overview

SifoWorks' IDP module not only detects intrusion attacks accurately and effectively, it can also analyze and prevent intrusions according to network needs.

⚠ Warning:

The IDP module ties up a considerable amount of system resources when activated. Hence, we recommend that you contact O2Security's technical support personnel before activating this module.

Enabling this module is not recommended if your network does not require IDP.

5.2 Configuring and Enabling IDP

This section explains the IDP function and guides you through the steps to configure and activate IDP on your SifoWorks device.

IDP Work Modes

SifoWorks supports 3 IDP working modes including:

- Sniffer

  This is an attack detection mode. In this mode, the system analyses data flow to detect intrusions only. The system notifies an administrator of any detected abnormalities by sending an alert and/or logging the event.

- In-line

  This is the attack prevention mode. In this mode, the system checks the data packets for any intrusions. When an abnormality is detected, the system blocks this data flow to prevent the intrusion.

- Stop

  Disable the IDP module.

IDP Rules

7500 IDP rules are pre-defined by the system, categorized into groups. You can manually select the rule groups your network requires. You can also define customize rules for more precise control.

IDP Pre-processors

SifoWorks also supports three pre-processing operations on all traffic before matching them against the IDP rules to raise system's performance and precision. The pre-processors include:

- IP Defragmentation

  This pre-processor assembles the fragments of a network packet.

- TCP Stream Reassembly

  This pre-processor assembles the payload of multiple packets belonging to the same TCP connection into one “large” packet before performing IDP analysis.

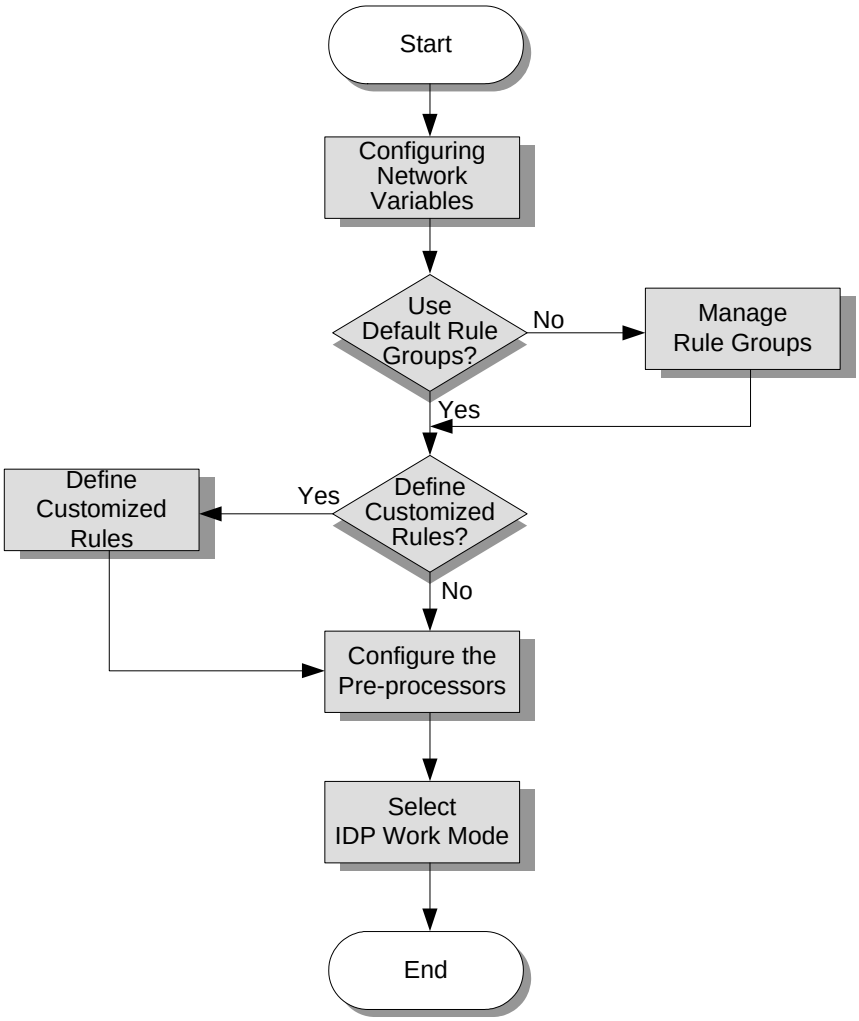
- Port Scan

  This pre-processor detects scan attacks on the protected ports. It automatically sends an alert to the system when such activities are detected.

Before enabling IDP, please ensure that your SifoWorks system has been successfully connected to your network by completing the basic network configuration operation. Please refer to “3.2 Setting up the Basic Network Settings” for details.

CONFIGURATION FLOWCHART

The configuration steps to configure and activate IDP are illustrated in the flowchart below.

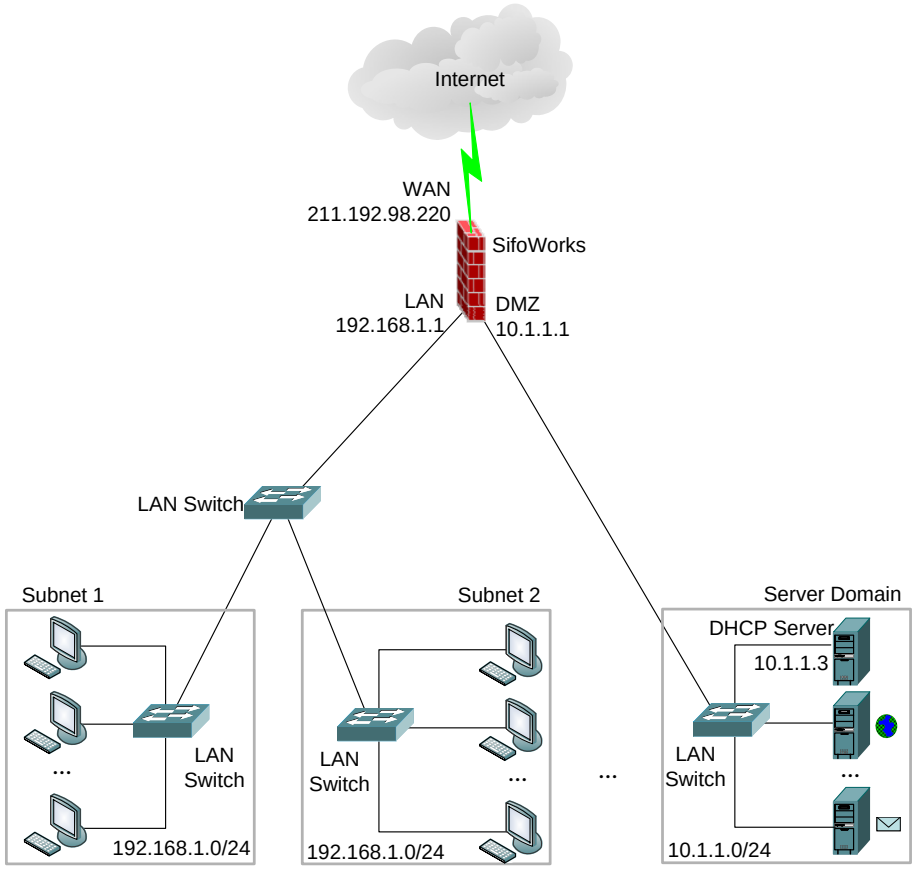

Start
Configuring Network Variables
Use Default Rule Groups?
No
Manage Rule Groups
Yes
Define Customized Rules?
Yes
Define Customized Rules
No
Configure the Pre-processors
Select IDP Work Mode
End

Each configuration is briefly introduced in the table below.

Operation	Description
Configuring Network Variables	Configure the system to differentiate between internal and external network addresses.
Manage Rule Groups	Enable entire rule groups or a subset of rules within a group and modify each rule's attributes.
Define Customized Rules	Add customized IDP rules.
Configure the Pre-processors	Select whether to enable the pre-processors (IP Defragmentation, TCP Stream Reassembly, Port Scan) and configure the corresponding parameters.
Select IDP Work Mode	Specify the IDP working mode.

APPLICATION EXAMPLE

The network topology used in this example is shown below.



After analyzing the network and company's policies, the administrator determines that the IDP function must be activated on SifoWorks with the following configuration:

- Internal networks: LAN and DMZ domains
- External network: WAN domain
- Use system pre-defined rules are to be used
- No additional customized rules
- Enable the IP Defragmentation pre-processor with default settings.

The configuration procedure is as follows:

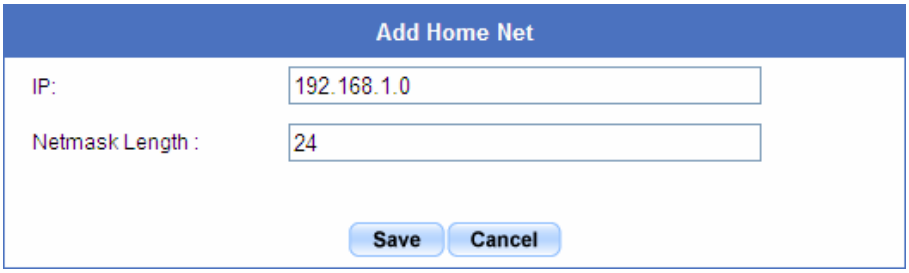
Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 Configure the IDP network variables

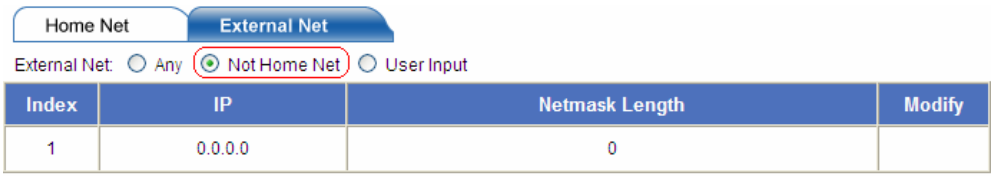
1. From the left menu bar, select **"IDP > Network Variables"**.
2. In the *"Home Net"* tab, select the **User Input** radio button to manually manage the list of internal networks.
3. Click **[Add New Home Net]**.
4. The "Add Home Net" interface will be displayed. Configure as follows:

   IP: 192.168.1.0

   Netmask Length: 24



5. Click **[Save]** to save the setting and return to the "Home Net" list.
6. Repeat steps 3 – 5 to add another internal network (DMZ) with **IP/Netmask Length** 10.1.1.0/24.
7. Select the *"External Net"* tab to view the list of external networks.
8. From the top of the list, select the **Not Home Net** radio button.

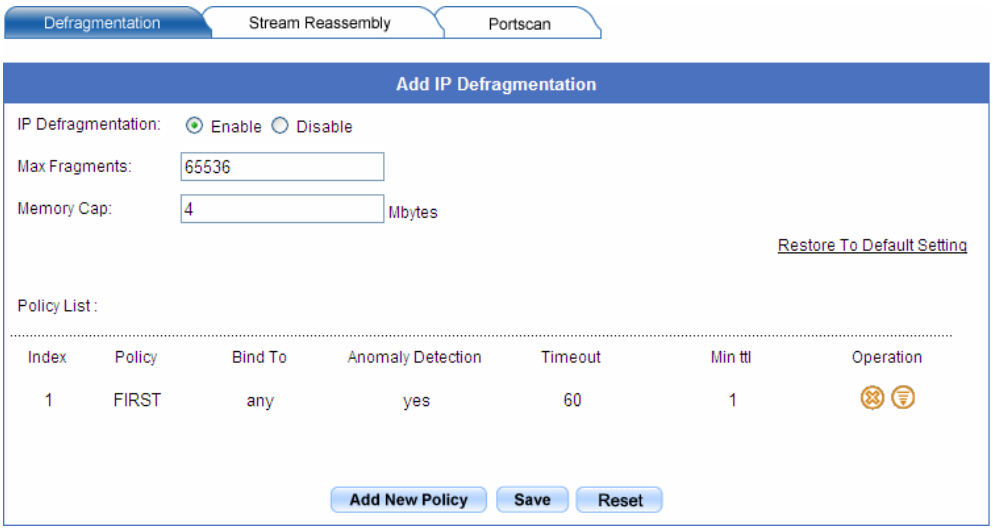


Step 3 Select the IDP rules

1. From the left menu bar, select **"IDP > Rule Group Control"**.
2. Check the **Enable** column to select the pre-defined IDP rule groups that you need to enable.
3. Click **[Save]** to save the settings.

Step 4 Set up the pre-processor

1. From the left menu bar, select **"IDP > Preprocessors"** to view the interface for the "*Defragmentation*" tab.
2. Select to "Enable" **IP Defragmentation**.



3. Leave the default settings for all parameters and click **[Save]** to save the configuration.
4. Select the "*Stream Reassembly*" tab and toggle to disable ("Off") the TCP stream reassembly pre-processor.
5. Click **[Save]** to save the settings.
6. Select the "*Portscan*" tab and toggle to disable ("Off") the Port scan pre-processor.
7. Click **[Save]** to save the settings.

Step 5 Select IDP work mode

1. From the left menu bar, select **"IDP > IDP Control"**.
2. Enable the IDP **state** "In-line".
3. Click **[Apply]** to save the configuration.

5.3 Upgrade IDP Rules

Through this function, you can upgrade your system's IDP pre-defined rule set to the latest version. The system automatically connects to the specified O2Security server to obtain the upgrade file.

You should add a notification email address to the system before performing an IDP upgrade. The system will then able to notify you if the upgrade failed.

Note:

You can also set up the system to automatically perform an IDP rule upgrade daily without manual operations from administrators.

CONFIGURATION PROCEDURE

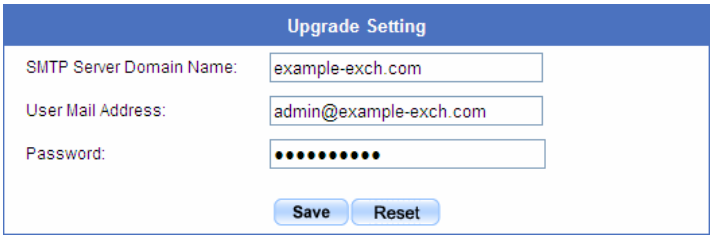
Before performing an IDP rule upgrade, ensure that your SifoWorks device is able to access external networks.

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 (Optional) Specify an email address

1. From the left menu bar, select **"IDP > Upgrade Setting"**.
2. In this interface, enter the domain name of the **SMTP Server** used to send the notification mail, the **User Mail Address** to send the mail to and the **Password** to authenticate SifoWorks with the SMTP server.



3. Click **[Save]** to save the settings. A success message should be displayed.

Step 3 Upgrade IDP rules

1. From the left menu column, select **"IDP > Rule Upgrade"**. The "Upgrade IDP Rule" interface will be displayed, showing the current IDP rule version.
2. Click **[Upgrade]**. An upgrade success message should be displayed after a few minutes.
3. Click **[OK]** to return to the "Upgrade IDP Rule" interface. Check to ensure that the IDP rule version displayed here has been changed.

Chapter

6

Virtual Private Networks

This chapter includes the following:

- Overview

  Briefly introduces SifoWorks high performance VPN engine and explains basic VPN concepts.

- Configuring IPsec VPN Connections

  Describes how to configure an IPsec VPN connection. Using examples, this section also introduces how to establish remote access VPN connections, site to site VPN connections and dynamic VPN connections based on DDNS.

- Configuring PPTP VPN Connections

  Describes how to configure a PPTP VPN connection.

- Configuring L2TP VPN Connections

  Describes how to configure a L2TP VPN connection.

This chapter is recommended for administrators wanting to configure SifoWorks' VPN related settings.

6.1 Overview

SifoWorks provides a high performance VPN engine, supporting IPsec VPN, PPTP VPN and L2TP VPN. This chapter explains how to set up VPN connections for each of these 3 types of VPN.

VPN (Virtual Private Network)

This refers to the creation of a temporary and secured connection from a public network (usually the Internet) to a private network. VPN helps to extend the company's internal network boundaries, allowing users on external networks to access internal resources safely.

The basic functions that a VPN connection should provide include:

- Data encryption to prevent data, transmitted via the public network, from being intercepted and leaked.
- Data and identity authentication to ensure that received data is complete and legal and to verify users' identity.
- Control accesses of different users to different resources.

IPsec (Internet Protocol Security) VPN

IPsec VPN is a commonly used method to establish VPN connections. An IPsec VPN includes:

- Transport mode and tunnel mode

  Transport mode protects higher layer protocols while tunnel mode protects the entire IP data packet.

- Encryption algorithm

  SifoWorks supports the DES and 3DES encryption algorithms. DES is a 64-bit encryption algorithm while 3DES is a 192-bit algorithm. This also means that 3DES's encryption strength is three times that of DES.

- Private key exchange algorithm

  SifoWorks includes the DH (Diffe-Hellman key agreement) and RSA (Rivest, Shamir and Adelman Signatures) private key exchange algorithms. These algorithms allow the two peers at each end of a connection to establish a secured shared encryption key via an unsecured communication tunnel.

- Verification algorithm

  SifoWorks supports the MD5 (Message Digest 5) and SHA-1 (Secure Hash Algorithm-1) verification algorithms. These algorithms generate data of a fixed length by processing input data of arbitrary length.

  HMAC-MD5 and HMAC-SHA are HMAC (Hashed Message Authentication Codes) strengthened variations of the MD5 and SHA algorithms. HMAC-MD5 generates an output of length 128-bits while HMAC-SHA generates output of length 160-bits.

- IKE (Internet Key Exchange)

  Used to verify the peer host at the end of the IPsec connection, and negotiate IKE SA and IPsec SA security policies.

- SA (Security Association)

  The security association negotiated between two end-points of a connection determines how to securely transmit data within the connection via secured services.

An IPsec VPN session goes through 5 main stages:

1. Determines the data packets that must be transmitted via the secured tunnel;
2. IKE phase one negotiation

   The two peers of a connection negotiate an IKE SA to verify the two peers establishing the IPsec connection. During this phase, a secured tunnel is also created to be used to negotiate the IPsec SA during IKE phase two.

3. IKE phase two negotiation

   IKE negotiates the IPsec SA parameters and establishes the IPsec SA between the two connection ends.

4. Data transfer

   Establishes the IPsec tunnel for data to be securely transmitted between the two ends of the connection

5. Terminate the IPsec VPN connection

PPTP (Point to Point Tunneling Protocol) VPN

Implements VPN using the PPTP protocol. PPTP VPN is only suitable for IP networks. Only 1 tunnel exists between any two end points of a PPTP VPN connection.

L2TP (Layer 2 Tunneling Protocol) VPN

Implements VPN using the L2TP protocol. L2TP VPN is suitable for various types of networks including IP, X.25, ATM and frame relay etc. Multiple tunnels can be established between any two end-points of a L2TP VPN connection.

Note:

SifoWorks should have already been connected to your network before configuring VPN. You can refer to "3.2 Setting up the Basic Network Settings" for details on setting up SifoWorks' network configurations.

6.2 Configuring IPsec VPN Connections

IPsec VPN is used to achieve two types of connection depending on the deployment of SifoWorks:

- Remote access

  SifoWorks is deployed only at one end of the VPN connection (such as the company's HQ network). This type of VPN connection allows mobile employees to access the company's main network remotely.

- Site-to-site access

  Two SifoWorks devices are deployed, one at each end of the VPN tunnel (such as company HQ and company branch office). Site to site VPN connections can be used to securely connect branch office networks to the main network.

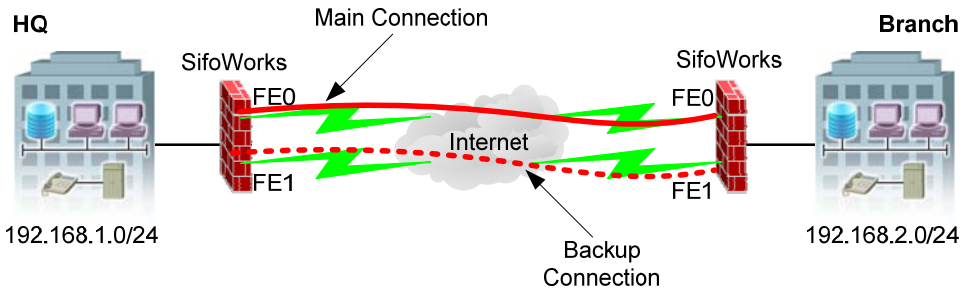
Note:

If your network needs to support dynamic VPN connections based on DDNS, please ensure that you have configured DDNS and PPPoE settings on SifoWorks. Please refer to "3.7 Configuring DDNS" and "3.5 Configuring PPPoE Connections" for details on DDNS and PPPoE configurations respectively.

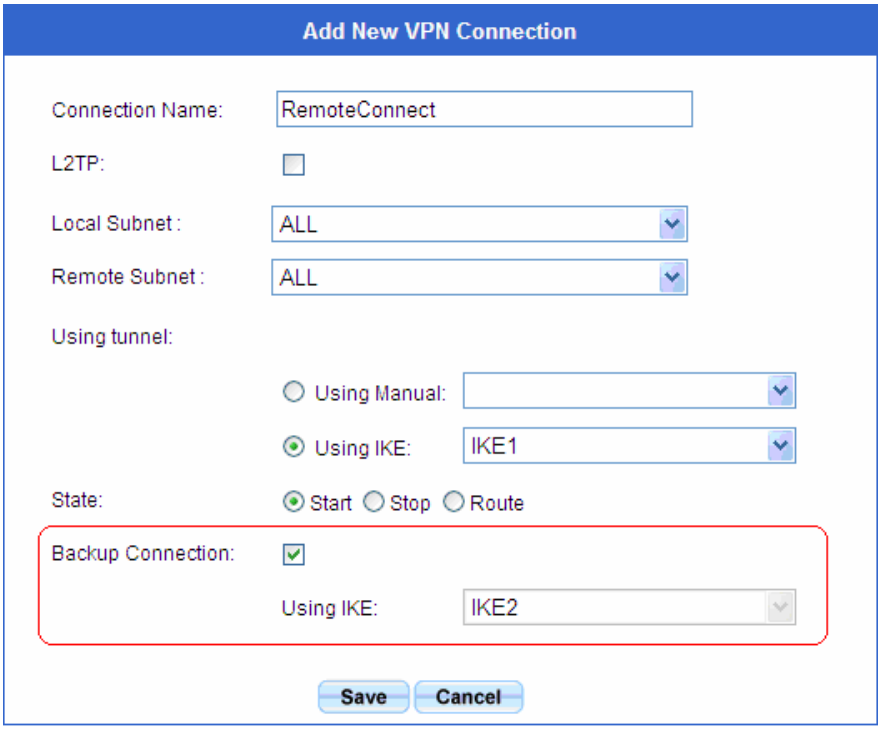
To ensure the reliability of VPN connections, SifoWorks also supports a VPN backup connection function. The backup connection will be automatically activated if the main connection is dropped. The figure below shows an example of a network that applies this function.

Note:

When the main connection is reconnected, the system will switch back to the main connection from the backup connection. This function is also supported for connections using the PPPoE access method.

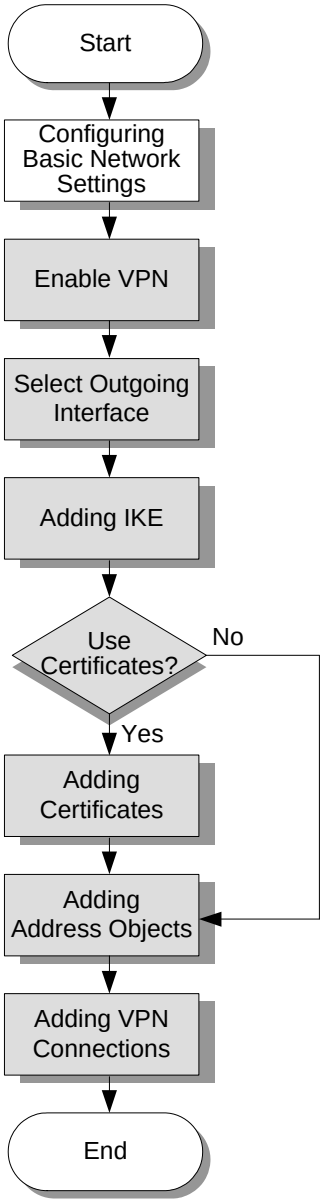


Note that you must add two IKE objects to enable the VPN backup connection function on SifoWorks. Enable this function from the “Add New VPN Connection” interface as shown below.



CONFIGURATION FLOWCHART

The flowchart below shows the steps to implement IPsec VPN using SifoWorks.

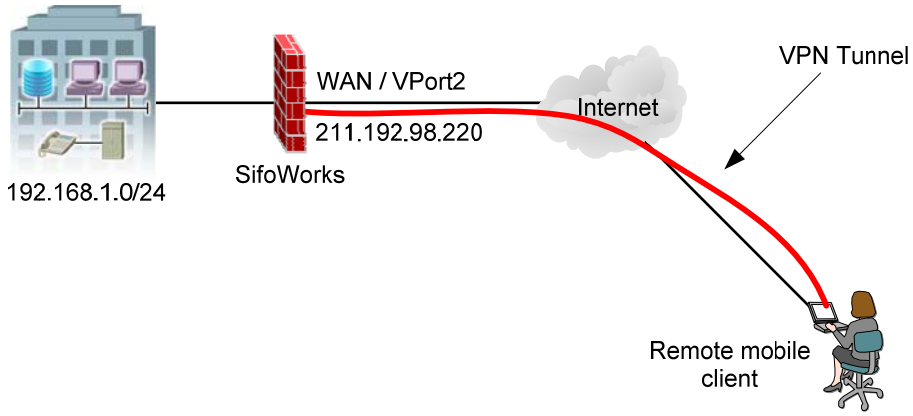


Each of the steps above is briefly introduced in the table below.

Operation	Description
Configuring Basic Network Settings	Refers to the configuration of virtual ports, VLANs, IP addresses and routes necessary to connect SifoWorks to the network. Note that you should assign the outgoing ports for VPN connections to virtual Port 2. For detailed information on how to configure these settings, please refer to "3.2 Setting up the Basic Network Settings".
Enable VPN	N.A.
Select Outgoing Interface	Select the VLAN (assigned with data ports in Virtual Port 2) to use these data ports as the outgoing interface for VPN connections.
Adding Certificates	Add the root CA, local CA and remote CA if needed for IKE authentication. Please skip this step if you are using the shared private key method for IKE authentication.
Adding IKE	Add the IKE (Internet Key Exchange) used to establish VPN connections.
Adding Address Objects	Add address objects representing the two end-points of a VPN connection.
Adding VPN Connections	N.A.

APPLICATION EXAMPLE 1 – REMOTE ACCESS

A system administrator wants to set up SifoWorks to implement IPsec VPN in the network shown below so as to provide secured remote accesses to internal resources by mobile employees.



In this network,

- First hop gateway IP from firewall to Internet is 211.192.98.217
- Pre-shared private key “123456” is used for authentication
- IKE phase 1 algorithm is “3des-md5-modp1536”
- IKE phase 2 algorithm is “esp-3des-md5”

The configuration procedure is as follows:

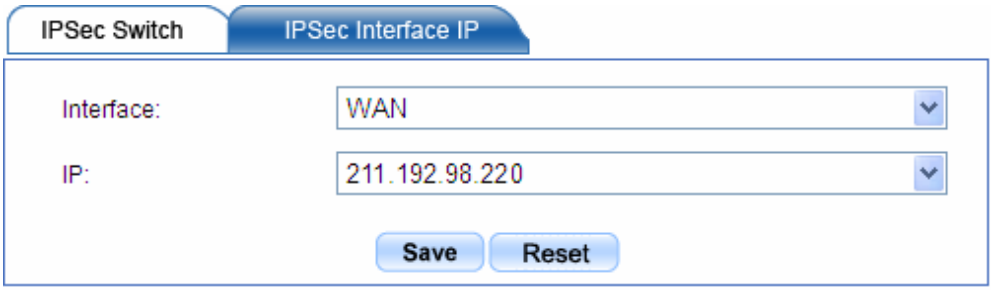
Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Enable VPN

1. From the left menu bar, select **“VPN > IPSec Setting”**.
2. Toggle the **VPN** module “ON”.
3. Click **[Save]** to confirm the setting.

Step 3 Select the outgoing interface

1. From the **“VPN > IPSec Setting”** interface, click the “*IPSec Interface IP*” tab.
2. Select the VLAN “WAN” as the outgoing **interface**.



3. Click **[Save]** to save the configuration.

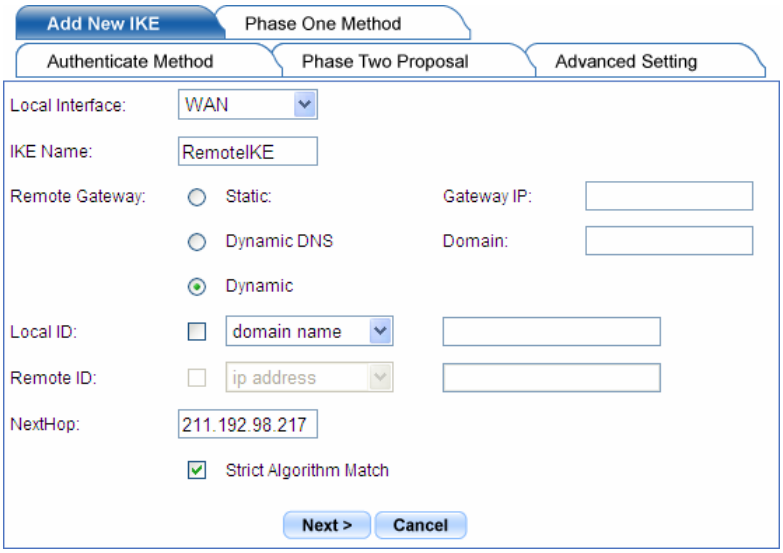
Step 4 Add IKE

1. From the left menu bar, select **"VPN > IKE"**.
2. From the bottom of the IKE list displayed, click **[Add New IKE]**.
3. The "*Add New IKE*" interface will be displayed. Configure as follows

   IKE Name: RemoteIKE

   Remote Gateway: Dynamic

   NextHop: 211.192.98.217

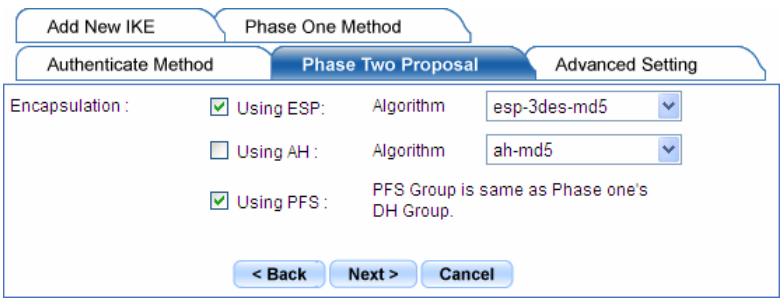


4. Click **[Next>]** to display the "*Phase One Method*" tab. Configure as follows:

   Algorithm: 3des-md5-modp1536

   Exchange: main mode

5. Click **[Next>]** to view the "*Authenticate Method*" tab. Select **PSK** and enter "123456" as the **Preshare Key**. Re-enter this key in the **Retype** textbox to confirm.
6. Click **[Next>]** to display the "*Phase Two Proposal*" tab. Enable **Using ESP** and select the "esp-3des-md5" ESP **Algorithm**. Also select the **Using PFS** option.



7. Click **[Next>]** to view the "*Advanced Setting*" tab. Keep the default configuration for all parameters in this tab and click **[Save]** to save this IKE record.

Step 5 Add address objects

1. From the left menu bar, select **"Object > Address"** to display the list of address objects.
2. Click **[Add New Address]** and configure as follows:

   Name: Local

   IP: 192.168.1.0

   Netmask: 255.255.255.0
3. Click **[Save]** to add the new address object.

Step 6 Add VPN connection

1. From the left menu bar, select **"VPN > VPN Connection"** to view the list of VPN connections.
2. Click **[Add New VPN]**.
3. In the "Add New VPN Connection" interface, configure as follows:

   Connection Name: RemoteConnect

   Local Subnet: Local

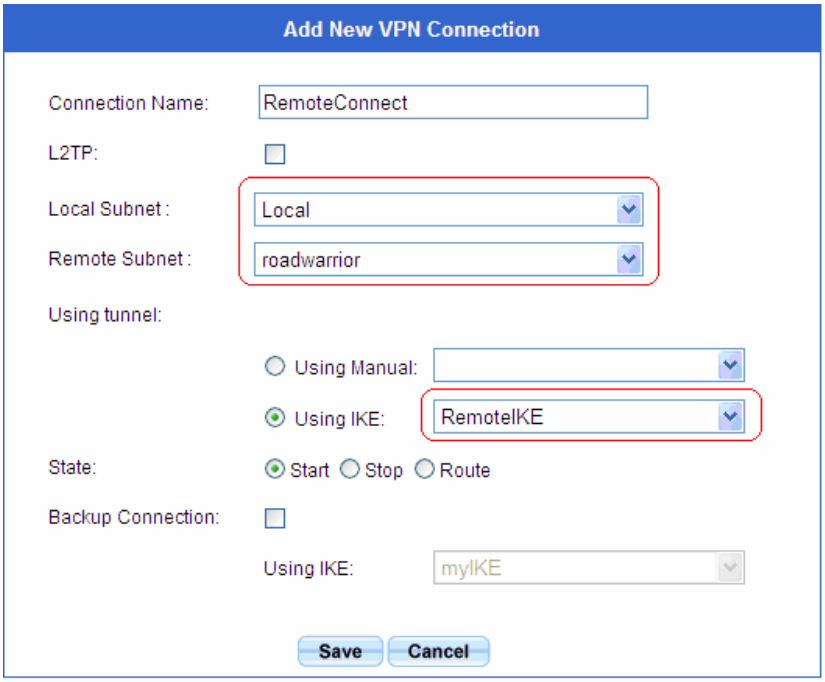
   Remote Subnet: roadwarrior

   Using Tunnel/Using IKE: RemoteIKE

   State: Start

📖 Note:

If the remote subnet of this VPN connection is dynamic (such as mobile client-end), select the address object "roadwarrior" for the **Remote Subnet** field. In this situation, VPN connections can only be initiated from the remote clients.

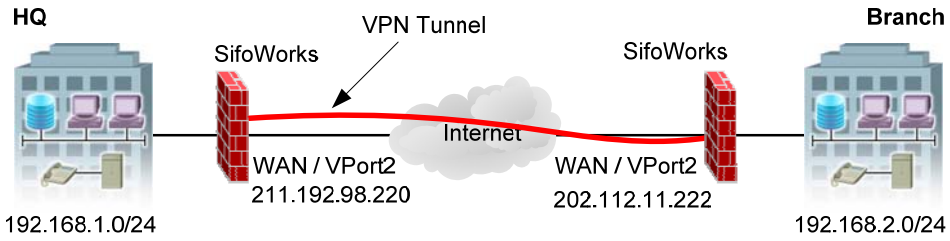


4. Click **[Save]** to add this VPN connection to the list.

APPLICATION EXAMPLE 2 – SITE TO SITE ACCESS

Two SifoWorks devices are deployed by the company, one in its HQ office network and another in its branch office network. To provide for secured accesses between the branch and HQ networks, the system administrators at each network must set up their respective SifoWorks device such that both devices are connected via a site-to-site VPN connection.

The network topology is shown below.



In the HQ network, SifoWorksA is deployed. The first hop gateway address from SifoWorksA to the Internet is 211.192.98.217.

SifoWorksB is deployed at the branch network and the first hop gateway address connecting SifoWorksB to the Internet is 202.112.11.1.

The site-to-site VPN connection uses pre-shared key authentication. The pre-shared key is “12345678”. IKE phase one algorithm is “3des-md5-modp1536” and the phase two algorithm is “esp-3des-md5”.

The configuration procedure is as follows:

SifoWorksA – HQ Network

Step 1 Login to SifoWorksA via a read/write administrator account.

Step 2 Activate VPN on SifoWorksA

1. From the left menu bar, select **"VPN > IPSec Setting"**.
2. Toggle the **VPN** module "On".
3. Click **[Save]** to confirm the setting.

Step 3 Select the outgoing interface for SifoWorksA

1. From the **"VPN > IPSec Setting"** interface, click the "*IPSec Interface IP*" tab.
2. Select the VLAN "WAN" as the outgoing **interface**.
3. Click **[Save]** to save the configuration.

Step 4 Adding IKE for SifoWorksA

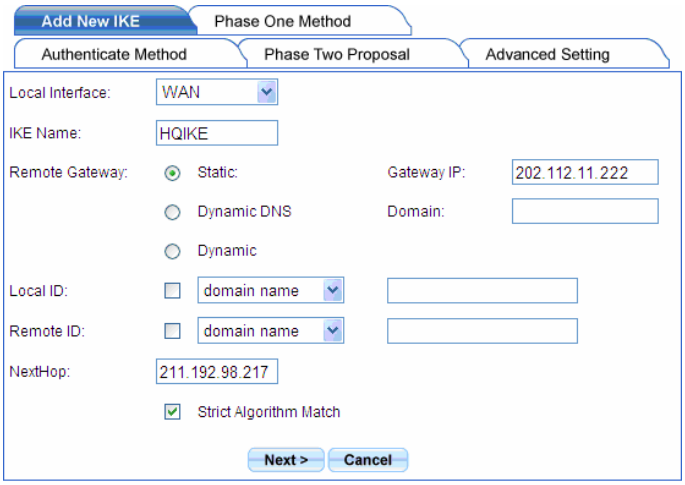
1. From the left menu bar, select **"VPN > IKE"**.
2. From the bottom of the IKE list displayed, click **[Add New IKE]**.
3. The "Add New IKE" interface will be displayed. Configure as follows:

   IKE Name: HQIKE

   Remote Gateway: Static

   Gateway IP: 202.112.11.222

   NextHop: 211.192.98.217

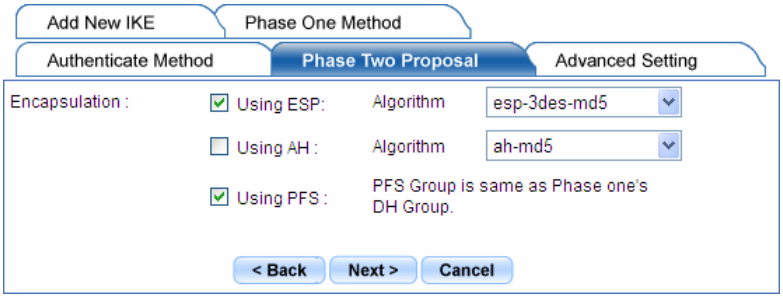


4. Click **[Next>]** to display the "*Phase One Method*" tab. Configure according to the following:

   Algorithm: 3des-md5-modp1536

   Exchange: main mode

5. Click **[Next>]** to view the "*Authenticate Method*" tab. Select **PSK** and enter "12345678" as the **Preshare Key**. Re-enter this key in the **Retype** textbox to confirm.
6. Click **[Next>]** to display the "*Phase Two Proposal*" tab. Enable **Using ESP** and select the "esp-3des-md5" ESP **Algorithm**. Also select the **Using PFS** option.



7. Click **[Next>]** to view the "*Advanced Setting*" tab. Keep the default configuration for all parameters in this tab and click **[Save]** to save this IKE record.

Step 5 Add address objects on SifoWorksA

1. From the left menu bar, select **"Object > Address"** to display the list of address objects.
2. Click **[Add New Address]** and configure as follows:

   Name: Local

   IP: 192.168.1.0

   Netmask: 255.255.255.0

3. Click **[Save]** to add the new address object.
4. Back at the address object list, click **[Add New Address]** to add another address object with the following configuration:

   Name: Remote

   IP: 192.168.2.0

   Netmask: 255.255.255.0

5. Click **[Save]** to save this address object.

Step 6 Add VPN connection on SifoWorksA

1. From the left menu bar, select **"VPN > VPN Connection"** to view the list of VPN connections.
2. Click **[Add New VPN]**.
3. In the "Add New VPN Connection" interface, configure as follows:

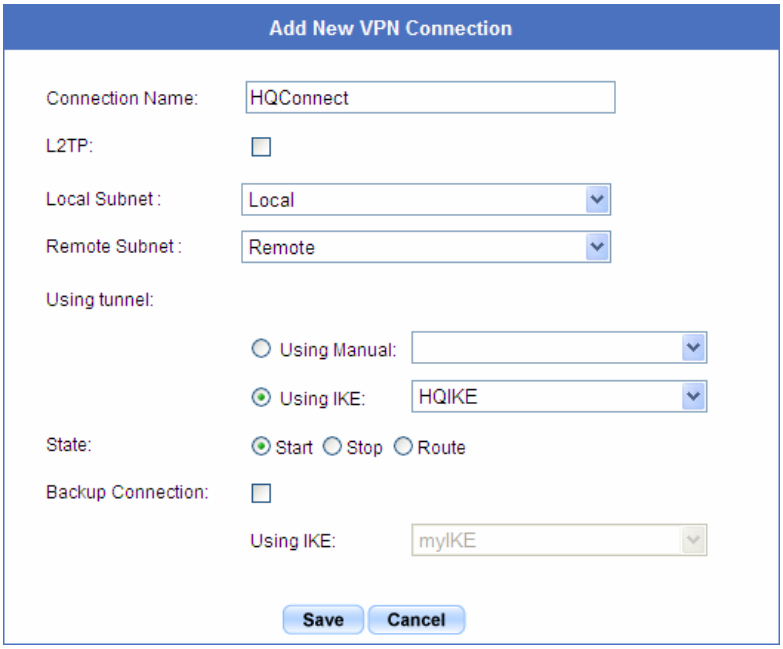
   Connection Name: HQConnect

   Local Subnet: Local

   Remote Subnet: Remote

   Using Tunnel/Using IKE: HQIKE

   State: Start



4. Click **[Save]** to add this VPN connection to the list.

SifoWorksB – Branch Network

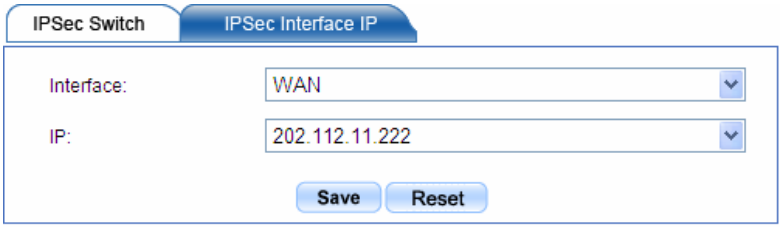
Step 7 Login to SifoWorksB via a read/write administrator account.

Step 8 Activate VPN on SifoWorksB

1. From the left menu bar, select **"VPN > IPSec Setting"**.
2. Toggle the **VPN** module "On".
3. Click **[Save]** to confirm the setting.

Step 9 Select the outgoing interface for SifoWorksB

1. From the **"VPN > IPSec Setting"** interface, click the "*IPSec Interface IP*" tab.
2. Select the VLAN "WAN" as the outgoing **interface**.
3. Click **[Save]** to save the configuration.



Step 10 Add IKE for SifoWorksB

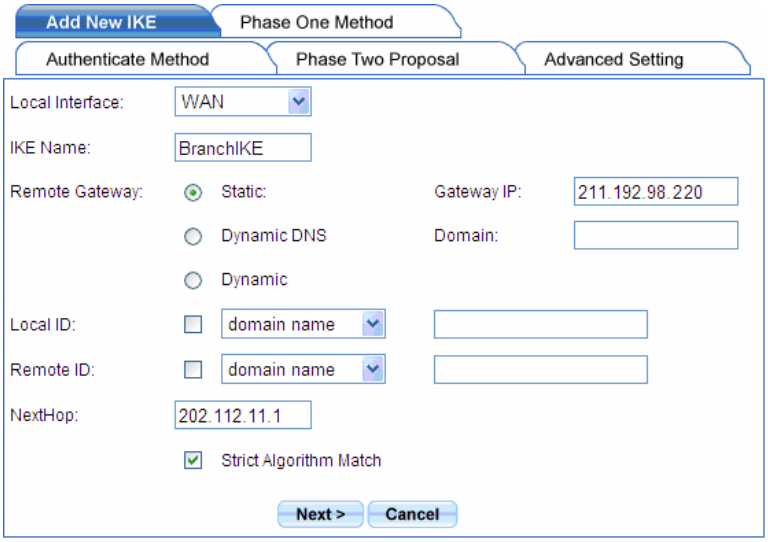
1. From the left menu bar, select **"VPN > IKE"**.
2. From the bottom of the IKE list displayed, click **[Add New IKE]**.
3. The "Add New IKE" interface will be displayed. Configure as follows:

   IKE Name: BranchIKE

   Remote Gateway: Static

   Gateway IP: 211.192.98.220

   NextHop: 202.112.11.1



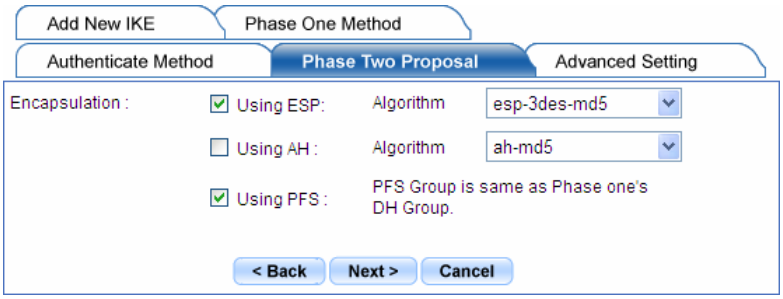
4. Click **[Next>]** to display the "*Phase One Method*" tab. The configuration is as follows:

   Algorithm: 3des-md5-modp1536

   Exchange: main mode

5. Click **[Next>]** to view the "*Authenticate Method*" tab. Select **PSK** and enter "12345678" as the **Preshare Key**. Re-enter this key in the **Retype** textbox to confirm.

6. Click **[Next>]** to display the "*Phase Two Proposal*" tab. Enable **Using ESP** and select the "esp-3des-md5" ESP **Algorithm**. Also select the **Using PFS** option.



7. Click **[Next>]** to view the "*Advanced Setting*" tab. Keep the default configuration for all parameters in this tab and click **[Save]** to save this IKE record.

Step 11 Add address objects on SifoWorksB

1. From the left menu bar, select **"Object > Address"** to display the list of address objects.
2. Click **[Add New Address]** and configure as follows:

   Name: Local

   IP: 192.168.2.0

   Netmask: 255.255.255.0

3. Click **[Save]** to add the new address object.
4. Back at the address object list, click **[Add New Address]** to add another address object with the following configuration:

   Name: Remote

   IP: 192.168.1.0

   Netmask: 255.255.255.0

5. Click **[Save]** to save this address object.

Step 12 Add VPN connection on SifoWorksB

1. From the left menu bar, select **"VPN > VPN Connection"** to view the list of VPN connections.
2. Click **[Add New VPN]**.
3. In the "Add New VPN Connection" interface, configure as follows:

   Connection Name: BranchConnect

   Local Subnet: Local

   Remote Subnet: Remote

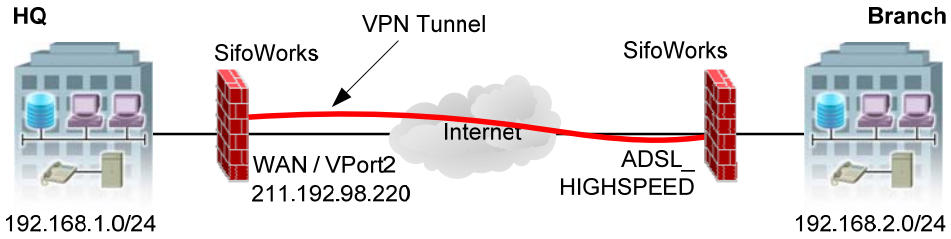
   Using Tunnel/Using IKE: BranchIKE

   State: Start

4. Click **[Save]** to add this VPN connection to the list.

APPLICATION EXAMPLE 3 – DYNAMIC VPN BASED ON DDNS

The network topology used in this example is shown below.



To ensure that communications between the network at the HQ office and that at the branch office is secure, the system administrators of each network needs to set up their SifoWorks to establish site-to-site VPN connections with the other network.

At the HQ office, the first hop gateway address between SifoWorks and the Internet is 211.192.98.217.

At the branch office, SifoWorks is connected to the Internet using PPPoE fast mode. The network's domain name registered with the DDNS service is www.example.com. VPN connections uses pre-shared key authentication with the pre-shared key "12345678". IKE phase one algorithm is "3des-md5-modp1536" and the phase two algorithm is "esp-3des-md5".

The configuration procedure is as follows:

SifoWorksA – HQ Network

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Enable VPN on SifoWorksA

1. From the left menu bar, select **"VPN > IPSec Setting"**.
2. Toggle the **VPN** module "On".
3. Click **[Save]** to confirm the setting.

Step 3 Select the outgoing interface for SifoWorksA

1. From the **"VPN > IPSec Setting"** interface, click the "*IPSec Interface IP*" tab.
2. Select the VLAN "WAN" as the outgoing **interface**.
3. Click **[Save]** to save the configuration.

Step 4 Adding IKE for SifoWorksA

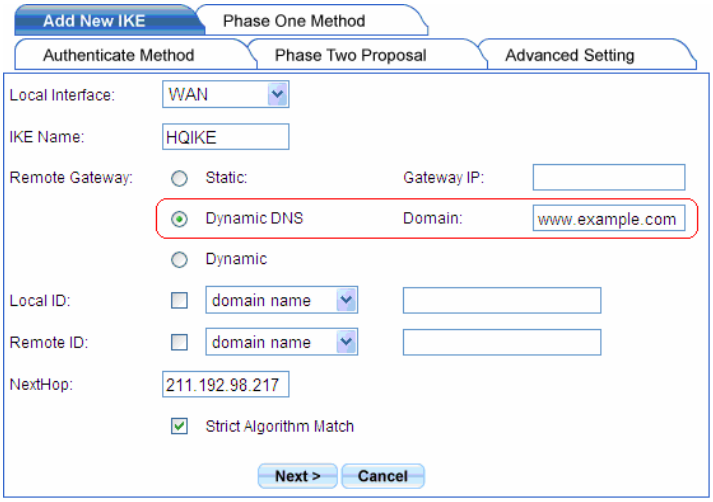
1. From the left menu bar, select **"VPN > IKE"**.
2. From the bottom of the IKE list displayed, click **[Add New IKE]**.
3. The "Add New IKE" interface will be displayed. Configure as follows:

   IKE Name: HQIKE

   Remote Gateway: Dynamic DNS

   Domain: www.example.com

   NextHop: 211.192.98.217

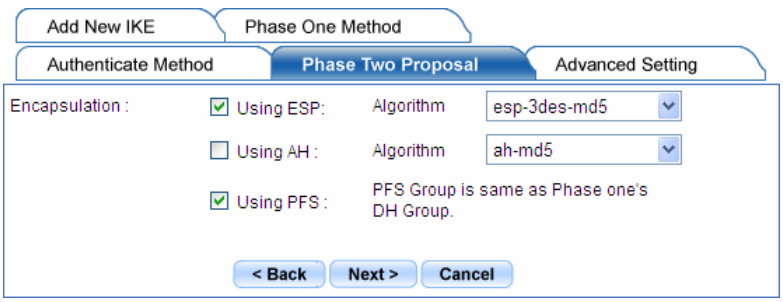


4. Click **[Next>]** to display the "*Phase One Method*" tab. Configure according to the following:

   Algorithm: 3des-md5-modp1536

   Exchange: main mode

5. Click **[Next>]** to view the "*Authenticate Method*" tab. Select **PSK** and enter "12345678" as the **Preshare Key**. Re-enter this key in the **Retype** textbox to confirm.
6. Click **[Next>]** to display the "*Phase Two Proposal*" tab. Enable **Using ESP** and select the "esp-3des-md5" ESP **Algorithm**. Also select the **Using PFS** option.



7. Click **[Next>]** to view the "*Advanced Setting*" tab. Keep the default configuration for all parameters in this tab and click **[Save]** to save this IKE record.

Step 5 Add address objects on SifoWorksA

1. From the left menu bar, select **"Object > Address"** to display the list of address objects.
2. Click **[Add New Address]** and configure as follows:

   Name: Local

   IP: 192.168.1.0

   Netmask: 255.255.255.0

3. Click **[Save]** to add the new address object.
4. Back at the address object list, click **[Add New Address]** to add another address object with the following configuration:

   Name: Remote

   IP: 192.168.2.0

   Netmask: 255.255.255.0

5. Click **[Save]** to save this address object.

Step 6 Add VPN connection on SifoWorksA

1. From the left menu bar, select **"VPN > VPN Connection"** to view the list of VPN connections.
2. Click **[Add New VPN]**.
3. In the "Add New VPN Connection" interface, configure as follows:

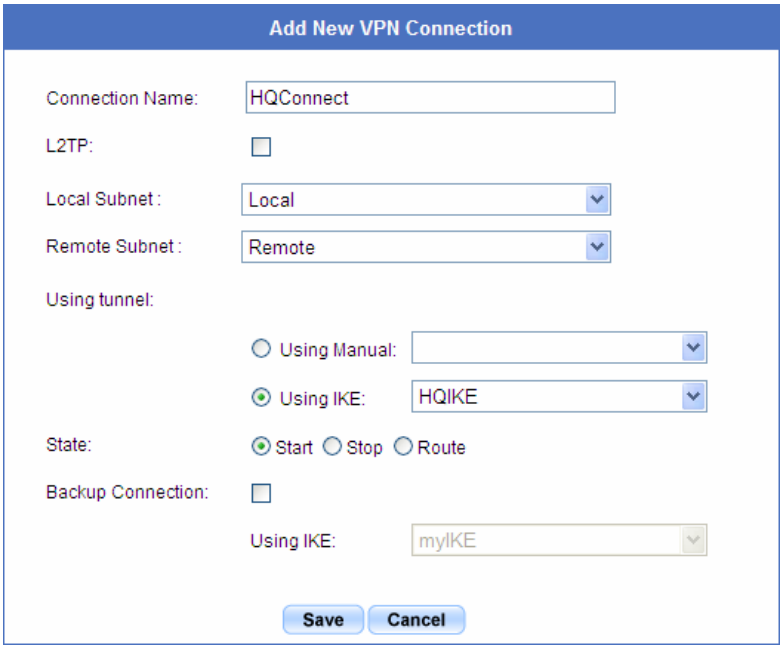
   Connection Name: HQConnect

   Local Subnet: Local

   Remote Subnet: Remote

   Using Tunnel/Using IKE: HQIKE

   State: Start



4. Click **[Save]** to add this VPN connection to the list.

SifoWorksB – Branch Network

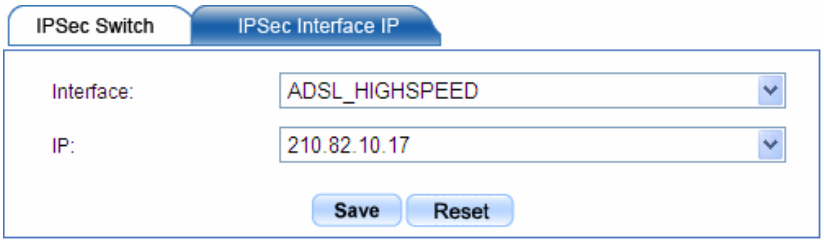
Step 7 Login to SifoWorksB via a read/write administrator account.

Step 8 Activate VPN on SifoWorksB

1. From the left menu bar, select **"VPN > IPSec Setting"**.
2. Toggle the **VPN** module "On".
3. Click **[Save]** to confirm the setting.

Step 9 Select the outgoing interface for SifoWorksB

1. From the **"VPN > IPSec Setting"** interface, click the "*IPSec Interface IP*" tab.
2. Select the VLAN "ADSL_HIGHSPEED" as the outgoing **interface**.



3. Click **[Save]** to save the configurations.

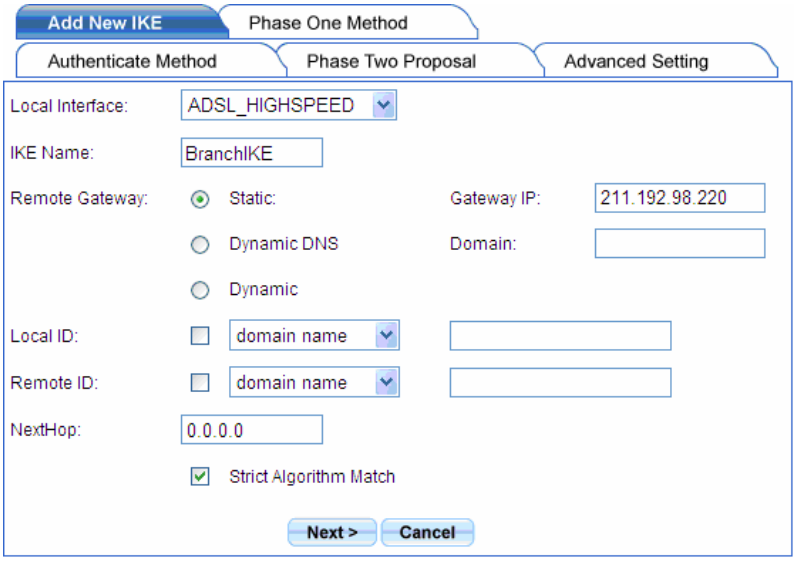
Step 10 Add IKE for SifoWorksB

1. From the left menu bar, select **"VPN > IKE"**.
2. From the bottom of the IKE list displayed, click **[Add New IKE]**.
3. The "Add New IKE" interface will be displayed. Configure as follows:

   IKE Name: BranchIKE

   Remote Gateway: Static

   Gateway IP: 211.192.98.220

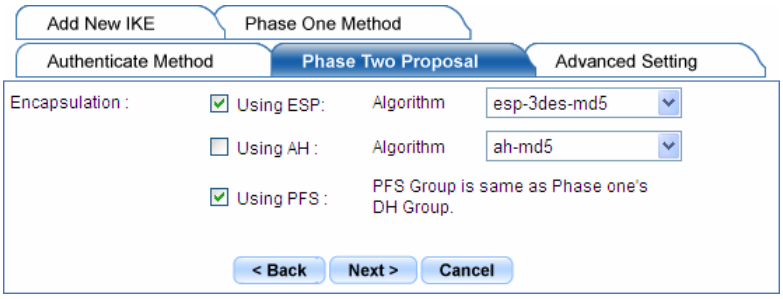


4. Click **[Next>]** to display the "*Phase One Method*" tab. The configuration is as follows:

   Algorithm: 3des-md5-modp1536

   Exchange: main mode

5. Click **[Next>]** to view the "*Authenticate Method*" tab. Select **PSK** and enter "12345678" as the **Preshare Key**. Re-enter this key in the **Retype** textbox to confirm.
6. Click **[Next>]** to display the "*Phase Two Proposal*" tab. Enable **Using ESP** and select the "esp-3des-md5" ESP **Algorithm**. Also select the **Using PFS** option.



7. Click **[Next>]** to view the "*Advanced Setting*" tab. Keep the default configuration for all parameters in this tab and click **[Save]** to save this IKE record.

Step 11 Add address objects on SifoWorksB

1. From the left menu bar, select **"Object > Address"** to display the list of address objects.
2. Click **[Add New Address]** and configure as follows:

   Name: Local

   IP: 192.168.2.0

   Netmask: 255.255.255.0

3. Click **[Save]** to add the new address object.
4. Back at the address object list, click **[Add New Address]** to add another address object with the following configuration:

   Name: Remote

   IP: 192.168.1.0

   Netmask: 255.255.255.0

5. Click **[Save]** to save this address object.

Step 12 Add VPN connection on SifoWorksB

1. From the left menu bar, select **"VPN > VPN Connection"** to view the list of VPN connections.
2. Click **[Add New VPN]**.
3. In the "Add New VPN Connection" interface, configure as follows:

   Connection Name: BranchConnect

   Local Subnet: Local

   Remote Subnet: Remote

   Using Tunnel/Using IKE: BranchIKE

   State: Start

4. Click **[Save]** to add this VPN connection to the list.

REFERENCE

Operations related to IPsec VPN connections include:

- 3.2 Setting up the Basic Network Settings
- 3.5 Configuring PPPoE Connections
- 3.7 Configuring DDNS

6.3 Configuring PPTP VPN Connections

Users remotely connected on a PPTP (Point to Point Tunneling Protocol) VPN connection can access the Internet via an encrypted tunnel. Since all PCs running on Windows 2000 or later versions are installed with a PPTP VPN client, the configuration task for PPTP is greatly simplified.

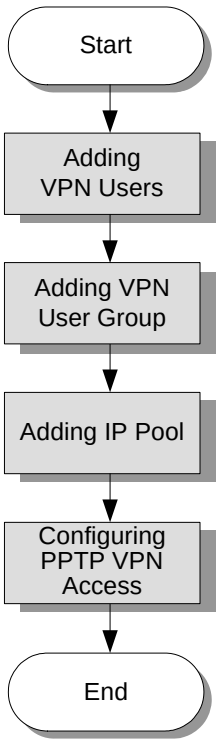
PPTP VPN connections are applicable for IP networks. Only one tunnel can be established between two peers connected via a PPTP VPN.

Note:

Please ensure that SifoWorks' basic network setting has already been configured. Please refer to "3.2 Setting up the Basic Network Settings" for details on this configuration.

CONFIGURATION FLOWCHART

The flowchart below shows the steps to configure a PPTP VPN.



This table briefly introduces each of the configuration steps.

Operation	Description
Adding VPN Users	To add PPTP VPN connection users.
Adding VPN User Groups	To manage PPTP VPN connection users using group objects for configuration convenience.
Adding IP Pool	To define a pool of IP addresses for PPTP VPN connections. This prevents accesses to the network via PPTP VPN from illegal users
Configuring PPTP VPN Access	N.A.

CONFIGURATION PROCEDURE

Step 1 Add VPN users

1. From the left menu bar, select **"System > Auth User"** to view the list of authentication users.
2. Click **[Add New Auth User]** from the bottom of this list.
3. In the displayed interface, enter the user's **User Name** and **Password**.
4. Select "PPTP" for the **User Attribute** parameter.
5. Click **[Save]** to save the new authentication user.
6. Repeat steps 2-5 to add other authentication users.

Step 2 Add VPN user groups

1. From the left menu bar, select **"System > Auth Group"**.
2. At the bottom of this list, click **[Add New Auth User Group]**.
3. Here, enter the authentication group **Name**. Select "PPTP" for **Attribute**. In **Auth Group**, select the users from the "Available Users" list and click the ---> button to add them to this group.
4. Click **[Save]** to save the authentication group.

Step 3 Add IP pool

1. From the left menu bar, select **"Object > IP Pool"**.
2. Click **[Add New IP Pool]** from the bottom of the IP Pool Object list.
3. Enter the **Name** of the IP pool object and specify the IP range in the **IP From** and **IP To** textboxes.
4. Click **[Save]** to save the new IP pool object.

Step 4 Configure PPTP VPN access

1. From the left menu bar, select **"VPN > PPTP"**.
2. In the "*PPTP VPN Access*" tab, configure as follows:

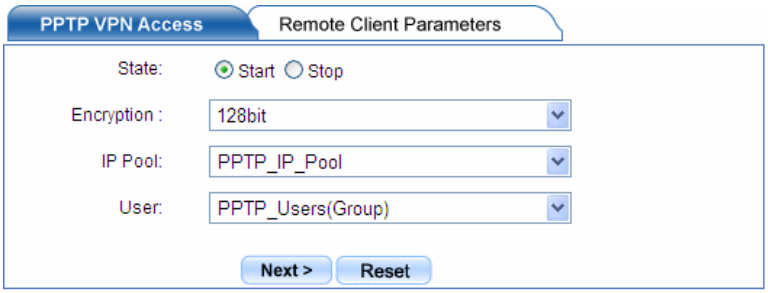
   State: Start

   Encryption: 128bit or 40bit

   IP Pool: *Select the IP pool object added in the previous step.*

   User: *Select the user group object added in step 2 or the user object added in step 1.*

   An example of the above configuration is shown in the figure below.



3. Click **[Next>]** to display the "*Remote Client Parameters*" tab.
4. (Optional) Enter the addresses of DNS and WINS servers to be used by the remote PPTP VPN users.
5. Click **[Save]** to save the PPTP VPN configurations.

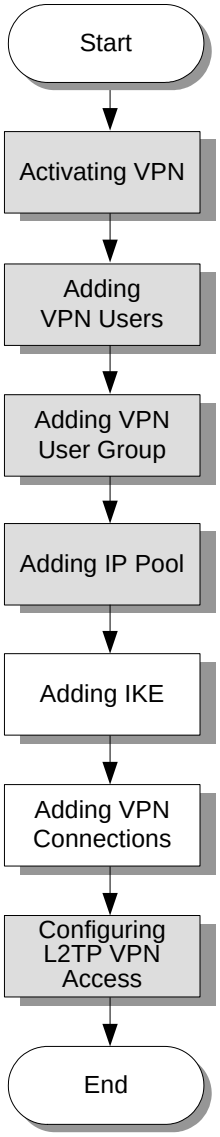
6.4 Configuring L2TP VPN Connections

Remote access users connected via a VPN connection over L2TP (Layer 2 Tunneling Protocol) accesses the internal network via an encrypted tunnel. Configuration for L2TP VPN is simplified as all PCs running windows 2000 or later operating systems are installed with the L2TP client.

L2TP VPN connections can be established in various types of networks including IP, X.25, ATM and frame relay networks etc. Multiple tunnels can be established between two end points of a L2TP VPN connection.

CONFIGURATION FLOWCHART

The flowchart below shows the steps to configure a L2TP VPN.



This table briefly introduces each of the configuration steps.

Operation	Description
Activating VPN	N.A.
Adding VPN Users	To add L2TP VPN connection users.
Adding VPN User Groups	To manage L2TP VPN connection users using group objects for configuration convenience.
Adding IP Pool	To define a pool of IP addresses for L2TP VPN connections. This prevents accesses to the network via L2TP VPN from illegal users
Adding IKE	To add the IKE used to establish L2TP VPN connections. Please refer to "6.2 Configuring IPsec VPN Connections" for details on IKE configuration.
Adding VPN Connection	To add a VPN connection that uses L2TP. Please refer to "6.2 Configuring IPsec VPN Connections" for information on how to add VPN connections
Configuring L2TP VPN Access	N.A.

CONFIGURATION PROCEDURE

Step 1 Activate VPN

1. From the left menu bar, select **"VPN > IPSec Setting"**.
2. In the "*IPSec Switch*" tab, toggle the **VPN** module "On".
3. Click **[Save]** to save the setting.

Step 2 Add VPN users

1. From the left menu bar, select **"System > Auth User"** to view the list of authentication users.
2. Click **[Add New Auth User]** from the bottom of this list.
3. In the displayed interface, enter the user's **User Name** and **Password**.
4. Select "L2TP" for the **User Attribute** parameter.
5. Click **[Save]** to save the new authentication user.
6. Repeat steps 2-5 to add other authentication users.

Step 3 Add VPN user groups

1. From the left menu bar, select **"System > Auth Group"**.
2. At the bottom of this list, click **[Add New Auth User Group]**.
3. Here, enter the authentication group **Name**. Select "L2TP" for **Attribute**. In **Auth Group**, select users from the "Available Users" list and click the ---> button to assign them to this group.
4. Click **[Save]** to save the authentication group.

Step 4 Add IP pool

1. From the left menu bar, select **"Object > IP Pool"**.
2. Click **[Add New IP Pool]** from the bottom of the IP Pool Object list.
3. Enter the **Name** of the IP pool object and specify the IP range in the **IP From** and **IP To** textboxes.
4. Click **[Save]** to save the new IP pool object.

Step 5 Add IKE

Add the IKE needed to establish L2TP VPN connections. Please disable the **Strict Algorithm Match** option when adding IKE. You can refer to "6.2 Configuring IPsec VPN Connections" for more information on IKE configuration.

Step 6 Add VPN connection

To add a VPN connection record used to implement L2TP VPN. Please select the **L2TP** checkbox in the "Add New VPN Connection" interface. For details on managing VPN connection records, please refer to "6.2 Configuring IPsec VPN Connections".

Step 7 Configure L2TP VPN access

1. From the left menu bar, select **"VPN > L2TP"**.
2. In the "*L2TP VPN Access*" tab, configure as follows:

   State: Start

   IP Pool: *Select the IP pool object added in the step 4.*

   VPN User: *Select the VPN user group object added in step 2 or the VPN user object added in step 1.*
3. Click **[Next>]** to display the "*Remote Client Parameters*" tab.
4. (Optional) Enter the addresses of DNS and WINS servers to be used by the remote L2TP VPN users.
5. Click **[Save]** to save the L2TP VPN settings.

Chapter

7

Advanced Functions

The following functions are explained in this chapter

- Overview

  Briefly introduces the various advanced functions provided by SifoWorks including QoS, HA, IDS and IRP update.

- Setting Up QoS Services

  Explains how to set up QoS service on SifoWorks to manage the bandwidth allocation of various data traffic.

- Limiting IP Traffic

  Explains how to limit the upload and download speeds of individual IP addresses or subnets.

- Activating High Availability

  Describes the procedure to enable HA using two SifoWorks devices to enhance system reliability.

- Configuring IDS Services

  Explains how to configure the SifoWorks' in-built IDS service. Also introduces the procedure to link SifoWorks to a third-party IDS device to equip the firewall with the IDS function.

- Upgrade Intelligent Recognized Protocols (IRP)

  Introduces how to update SifoWorks' IRP module.

Reading this chapter is recommended if you are configuring the system to provide QoS, IP rate limit, HA, IDS or IRP related services.

7.1 Overview

SifoWorks' advanced functions include QoS (quality of service), IP rate limit, HA (high availability), IDS (Intrusion Detection System) and IRP (Intelligent Recognized Protocol), helping you better manage your network's bandwidth, prevent well-known attacks and enhance system reliability.

7.2 Setting Up QoS Services

This section explains the QoS function and guides you through an example on how to configure QoS to manage your network's bandwidth.

You can define QoS for the virtual ports independently on the SifoWorks system. Hence, please assign the device's data ports to each virtual port logically according to your actual network. For further details on managing virtual ports, please refer to "3.2 Setting up the Basic Network Settings".

Maximum Bandwidth

This refers to the maximum bandwidth allocated to traffic transmitted via the corresponding virtual port where QoS is enabled. Virtual ports' maximum bandwidth restriction is immediately effective even if QoS is not applied on any filter rule.

QoS Priority Levels

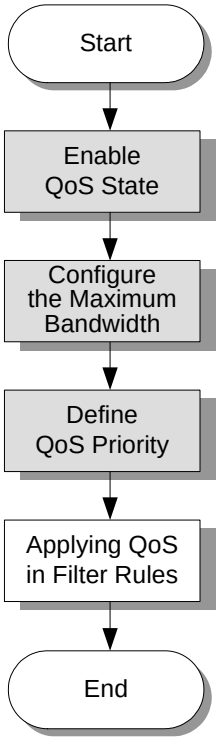
Each virtual port includes 4 QoS priority levels (0-3), each configured with a guaranteed and a maximum bandwidth. A different QoS priority level for incoming and outgoing interfaces can be selected when applying QoS onto a filter rule, imposing separate bandwidth limitations on the two interfaces.

A non-zero maximum and guaranteed bandwidth configuration for QoS level 0 is taken to be the default values for the corresponding virtual port. This configuration is effective even if QoS is not applied onto a filter rule.

The maximum bandwidth for any QoS level cannot be higher than the maximum bandwidth of the virtual port. Maximum bandwidth configured for QoS levels 1-3 cannot be higher than that for level 0.

CONFIGURATION FLOWCHART

The flowchart below illustrates the procedure to set up SifoWorks' QoS service.

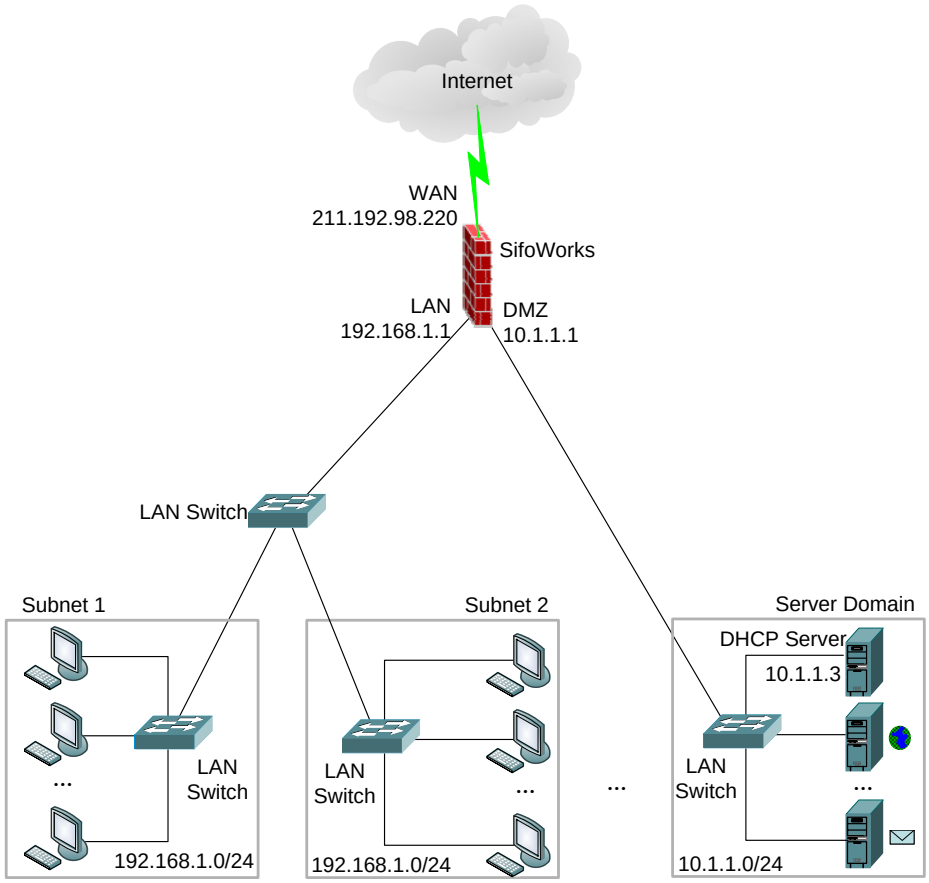


Each of the above operations is introduced in the table below.

Operation	Description
Enable QoS State	Activate QoS for some or all virtual ports.
Configure the Maximum Bandwidth	Specify the maximum bandwidth for each virtual port.
Define QoS Priority	Set up the bandwidth of each QoS priority level for the virtual ports.
Applying QoS in Filter Rules	Select the incoming and outgoing interfaces' QoS priority level in filter rules. For details on configuring filter rules, please refer to "4.2 Managing Filter Rules".

APPLICATION EXAMPLE

In the network topology shown below, a system administrator wants to apply QoS on all traffic from WAN to DMZ. The maximum and guaranteed bandwidth for Virtual Port 2 and Virtual Port 3 are 60Mbps and 20Mbps respectively.

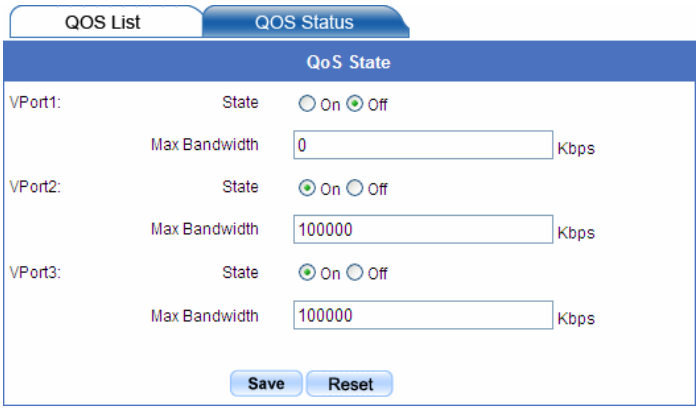


The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Enable QoS state for the virtual ports and specify the maximum bandwidth.

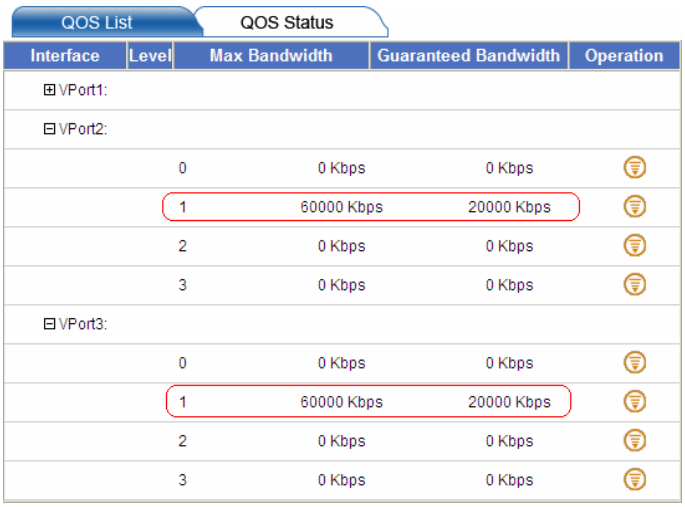
1. From the left menu bar, select **"Advance > QoS Setting"**.
2. Click the "*QOS Status*" tab to view the "QoS State" interface. Here, select the "On" **State** for VPort2 and VPort3. Set the **Max. Bandwidth** for both virtual ports to "100000".



3. Click **[Save]** to save the setting.

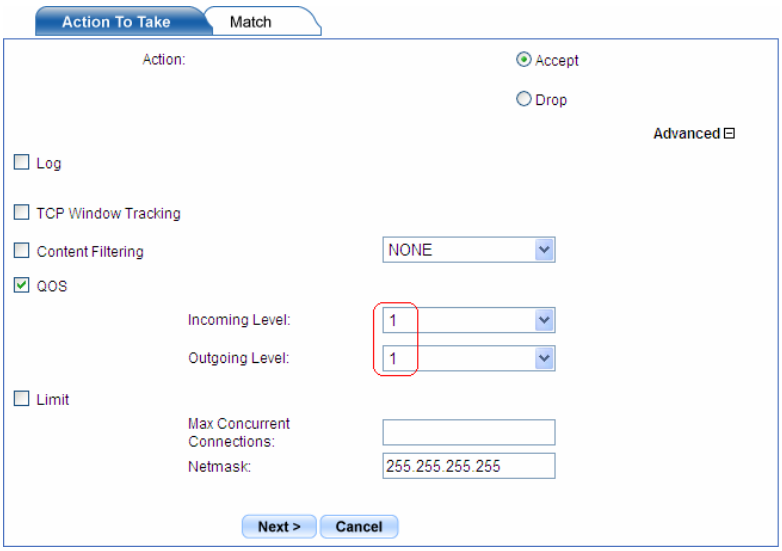
Step 3 Define QoS priority levels for each virtual port.

1. Select **"Advance > QoS Setting"** from the left menu bar and click the "*QOS List*" tab.
2. Click the "⊞" icon corresponding to VPort2 to expand the list to display virtual port 2's priority levels.
3. Click the icon for VPort2's priority level "1". In the interface that displays, enter "60000" and "20000" in the **Max. Bandwidth** and **Guaranteed Bandwidth** textboxes respectively.
4. Click **[Save]** to save the setting and return to the QoS list.
5. Repeat steps 2-4 to configure the QoS priority level for VPort3. The resulting QoS list should be similar to the figure below.



Step 4 Add a filter rule that applies QoS

From the left menu bar, select **"Firewall > Filter Rule"** to add a new filter rule for traffic from WAN to DMZ. Enable the **QoS** advanced rule option and select the priority level "1" for both the **incoming** and **outgoing** interfaces.



REFERENCE

Please refer to "4.2 Managing Filter Rules" for more information on adding filter rules.

7.3 Limiting IP Traffic

This function allows you to limit the upload and download bandwidth of individual IP addresses or entire subnets. This enables you to control the traffic of specific hosts or subnets, preventing network bandwidth from being tied up by only a small number of hosts (due to large network activities such as the usage of BT or P2P softwares). SifoWorks' IP rate limit function displays powerful performance as it is handled by the hardware. IP rate limit targets can include:

- Specific Host (**Type** = "Host")

  This is a host corresponding to a specific IP address. SifoWorks can restrict the upload and download bandwidth of this host.

- IP Range (**Type** = "Range")

  All hosts with IP addresses within the specified IP range. SifoWorks restricts the bandwidth available for all hosts in this group.

- Subnet (**Type** = “Subnet”)

  This refers to all hosts with IP addresses belonging to the specified subnet. SifoWorks controls the bandwidth available for all hosts in this subnet using one of two modes:

  - Single

    In this mode, the upload and download limit is applicable to each host in the subnet individually.

  - Share

    In this mode, the upload and download limit is the total bandwidth allocated to all hosts in the subnet.

Note that the range for both upload and download limit is 100kbit/s to 100,000,000kbit/s. You can set either limit as “0” to represent unlimited bandwidth.

SifoWorks is able to limit the traffic flow for up to 400 hosts defined as either individual hosts (**Type** = “Host”) or hosts within IP ranges (**Type** = “Range”). The system is also able to limit traffic for up to 8 subnets, each containing up to 512 hosts. The total number of hosts supported by this function, inclusive of all hosts in subnets, IP ranges and individual hosts, is 640.

📖 Note:

SifoWorks’ IP rate limit function also supports SNAT. That is, the IP addresses defined for IP rate limit can be the source address of a host requiring SNAT.

DNAT is currently not supported by this function. That is, IP rate limit cannot include the destination addresses of hosts requiring DNAT.

SifoWorks IP rate limit can operate in conjunction with the IRP (Intelligent Recognized Protocols) and QoS functions, providing comprehensive layer 3 intelligent flow control:

- Enable IRP and QoS functions in filter rules to achieve overall flow control based on protocols.
- In the IP rate limit function, define a “Subnet” type limit. This achieves a 2nd level of flow control for entire subnets.
- In the IP rate limit function, define “Host” type limits to achieve flow control over individual hosts.

APPLICATION EXAMPLE

A system administrator needs to set up SifoWorks to achieve the following flow control:

Type	Limit
Subnet: 192.168.1.0/255.255.255.0	Share mode. Bandwidth limit for the entire subnet is: • Upload limit: 20Mbit/s • Download limit: 40Mbit/s
IP Range: 192.168.2.1 – 192.168.2.20	For each host in this range: • Upload limit: 1Mbit/s • Download limit: 1Mbit/s
Host: 192.168.2.21	For this host: • Upload limit: 2Mbit/s • Download limit: 2Mbit/s

The configuration procedure is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **"Advance > IP Rate Limit"**.

Step 3 Add a IP limit for the subnet

1. Click **[Add]** from the bottom of the list displayed.
2. The "Add IP Rate Limit" interface will be displayed. Here, configure:

   IP Address/Type: Subnet

   Address: 192.168.1.0

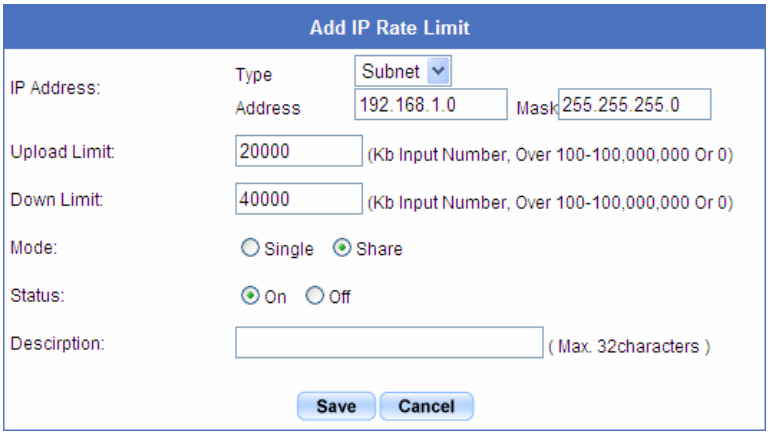
   Mask: 255.255.255.0

   Upload Limit: 20000

   Down Limit: 40000

   Mode: Share

   Status: On



3. Click **[Save]** to save the new limit and return to the IP rate limit list.

Step 4 Add IP rate limit for the IP range

1. Click **[Add]** from the bottom of the list displayed.
2. The "Add IP Rate Limit" interface will be displayed. Here, configure:

   IP Address/Type: Range

   Address: 192.168.2.1 **To** 192.168.2.20

   Upload Limit: 1000

   Down Limit: 1000

   Status: On
3. Click **[Save]** to save the new limit and return to the IP rate limit list.

Step 5 Add IP rate limit for the single host

1. Click **[Add]** from the bottom of the list displayed.
2. The "Add IP Rate Limit" interface will be displayed. Here, configure:

   IP Address/Type: Host

   Address: 192.168.2.21

   Upload Limit: 2000

   Down Limit: 2000

   Status: On
3. Click **[Save]** to save the new limit and return to the IP rate limit list.

Step 6 (Optional) Adjust the list of IP rate limits.

SifoWorks matches data packets to the IP rate limits by scanning the list in a top down manner. You may wish to adjust the position of IP rate limits in this list according to actual network situation to achieve better performance.

To adjust the position of an IP rate limit in the list, simply enter the current index of the limit in the **Move From** textbox at the bottom of the list. Enter the position to move this limit to in the adjacent **TO** textbox and click **[OK]**.

For example, to move the limit at index “1” to index “3”, simply enter “1” in the **Move From** textbox, “3” in the **TO** textbox and click **[OK]**.

Step 7 Enable IP rate limit

At top of the IP rate limit list, select “On” for the **Switch** parameter and click **[OK]** to enable this function.

REFERENCE

From the system generated bandwidth reports, you can adjust the IP rate limit configuration according to the network situation. For details on viewing reports, please refer to “10.3 Viewing Reports”.

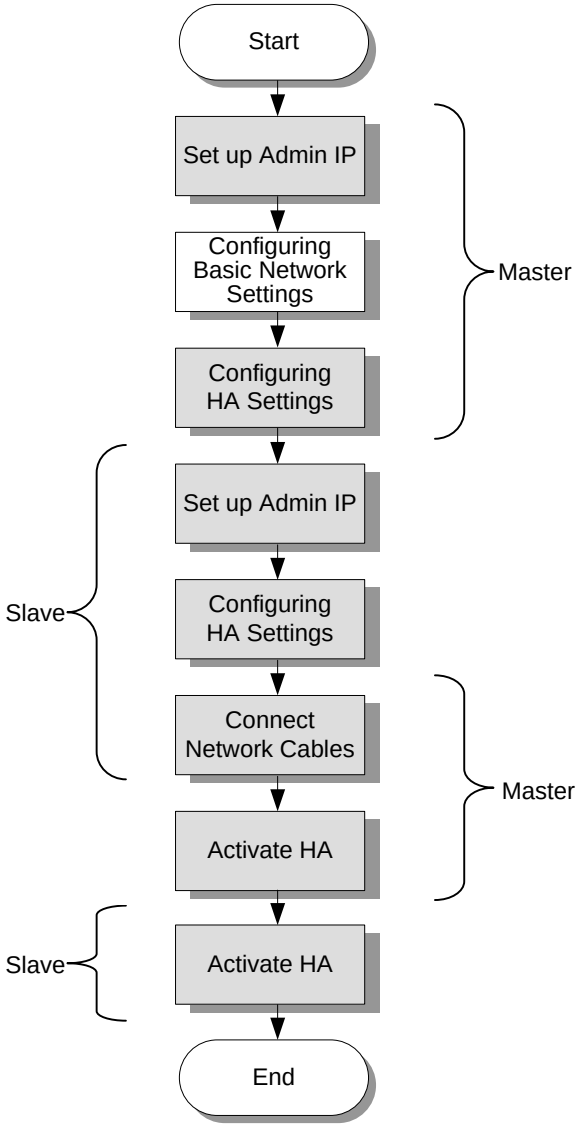
7.4 Activating High Availability

You can set up two SifoWorks device in HA (High availability) to enhance the reliability of the network. SifoWorks HA function supports the Active-Standby (AS) mode.

In AS mode, information such as rules, objects, routes and sessions are synchronized between the master and slave devices. When the master device fails, network services are automatically routed to the slave device.

CONFIGURATION FLOWCHART – AS MODE

The following flowchart shows the procedure to set up two SifoWorks devices to work in HA-AS mode.



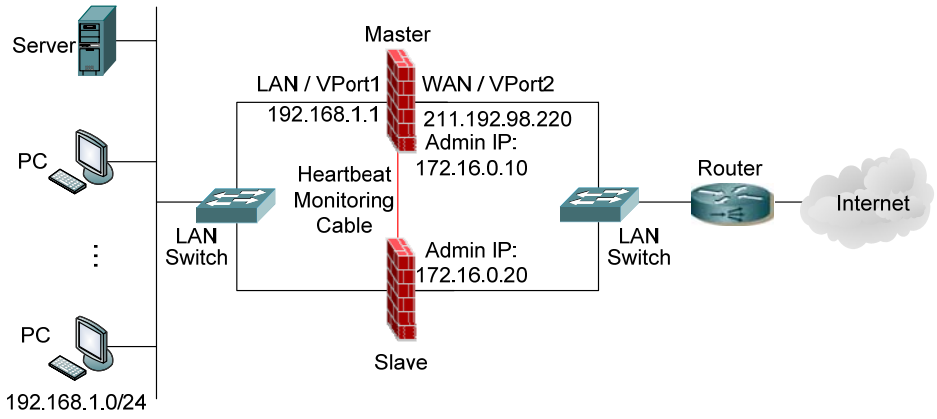
The above flowchart is briefly explained in the table below.

Device	Operation	Description
Master	Set up Admin IP	Specify the administrative IP address of the master SifoWorks device.
	Configuring Basic Network Settings	Set up the virtual port, VLAN, IP address and route configurations necessary to connect SifoWorks to your network. Please refer to "3.2 Setting up the Basic Network Settings" for details on configuring the device's basic network settings. Note that under HA, both static and dynamic IP address configuration for VLANs are supported.
	Configuring HA Settings	Configure HA related parameters including local IP, neighbor IP, keepalive heartbeat and HA timeout etc.
Slave	Set up Admin IP	Specify the administrative IP address of the slave SifoWorks device.
	Configuring HA Settings	Configure HA related parameters including local IP, neighbor IP, keepalive heartbeat and HA timeout etc.
Master & Slave	Connect Network Cables	Connect a data cable and a heartbeat monitoring cable between the master and slave devices and connect the devices to the network.
Master	Activate HA	Activate HA on the master device.
Slave	Activate HA	Activate HA on the slave device.

Note: The "Set up Admin IP" operation is a part of the "Configure Basic Network Settings" operation. This flowchart separates the two for greater clarity.

APPLICATION EXAMPLE

The network topology in this example is shown below.



In this network,

- Administrative IP of the master SifoWorks device (SifoWorksA) is 172.168.0.10.
- Administrative IP of the slave SifoWorks device (SifoWorksB) is 172.168.0.20.
- A standard network cable connecting the monitor port of both devices acts as the heartbeat monitoring cable.
- IP address of LAN domain connected to each devices' FE0 port is 192.168.1.1.
- IP address of the WAN domain connected to each devices' FE1 port is 211.192.98.220.

The configuration procedure is as follows:

Step 1 Disconnect all network cables from the master and slave devices.

You may skip this step if your devices are not yet connected to your network.

SifoWorksA – Master Device

Step 2 Login to SifoWorksA via a read/write account.

Step 3 Configure the firewall's administrative IP as "172.16.0.10".

1. Select **"Network > IP Config"** from the left menu bar.
2. Click the icon corresponding to the "Admin" VLAN in the displayed list to set up the administrative IP.

   Please refer to "3.2 Setting up the Basic Network Settings" for detailed information on this configuration.

Step 4 Configure the basic network settings

Configure SifoWorksA's virtual ports, VLAN, IP address and route settings according to your network requirements.

You can refer to "3.2 Setting up the Basic Network Settings" for details on this configuration.

Step 5 Configure HA settings

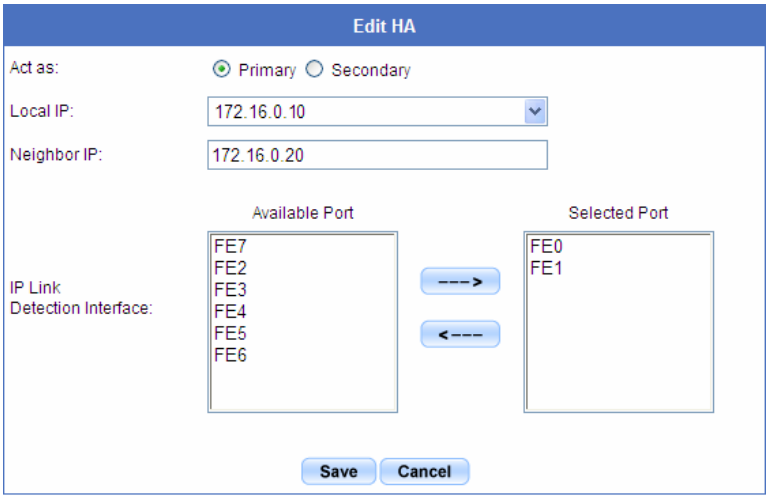
1. From the left menu bar, select **"Advance > HA Setting"**.
2. At the top right corner of the interface that displays, click "**Edit**" to view the "Edit HA" interface.
3. Here, configure as follows:

   Act As: Primary

   Local IP: 172.16.0.10

   Neighbor IP: 172.16.0.20

   IP Link Detection Interface: FE0, FE1



4. Click **[Save]** to save the HA configuration on SifoWorksA.

SifoWorksB – Slave Device

Step 6 Login to SifoWorksB using a read/write administrator account.

Step 7 Configure the firewall's administrative IP as "172.16.0.20".

1. Select **"Network > IP Config"** from the left menu bar.
2. Click the icon corresponding to the "Admin" VLAN in the displayed list to set up the administrative IP.

   Please refer to "3.2 Setting up the Basic Network Settings" for detailed information on this configuration.

Step 8 Configure HA settings

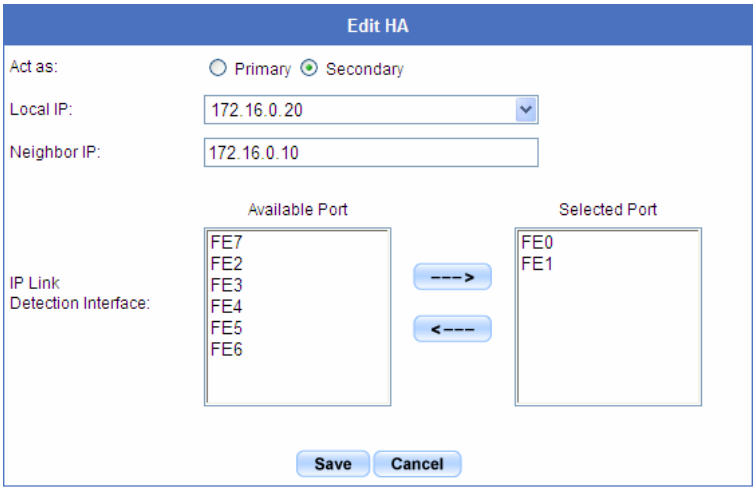
1. From the left menu bar, select **"Advance > HA Setting"**.
2. At the top right corner of the interface that displays, click "**Edit**" to view the "Edit HA" interface.
3. Here, configure as follows:

   Act As: Secondary

   Local IP: 172.16.0.20

   Neighbor IP: 172.16.0.10

   IP Link Detection Interface: FE0, FE1



4. Click **[Save]** to save the HA configuration on SifoWorksB.

SifoWorksA & SifoWorksB

Step 9 Connect the network cables

1. According to your deployment plan, connect the master and slave devices' data ports to the various network domains.
2. Connect a network cable from the monitor port of the master device to the monitor port of the slave device. This acts as the heartbeat monitoring cable.

SifoWorksA

Step 10 Activate HA on the master device

1. Login to SifoWorksA via a read/write administrator account.
2. From the left menu bar, select **"Advance > HA Setting"**.
3. Click **[Start]** from the bottom of this interface to activate HA. A success message should be displayed.

SifoWorksB

Step 11 Repeat step 10 to activate HA on SifoWorksB

SifoWorksB will automatically synchronize its configurations with the master device and reboot after activating HA. Both devices should be operating normally once the system restarts.

7.5 Configuring IDS Services

You can configure and enable SifoWorks' own IDS function or set up the system to access a third-party IDS system to provide IDS service.

SifoWorks' IDS function defends against the following types of attacks:

- SYN Flood
- TCP Scan
- Ping Sweep
- Ping Flood
- UDP Flood
- UDP Scan
- ARP Attack
- TearDrop
- Bonk
- Boink
- Nestea
- Newtear
- SYNDrop
- Jolt2
- Oshare
- 1234
- Ping of Death
- Saihyousen
- Smurf Attack
- Land-based Attack
- WinNuke

SifoWorks' IDS Working Modes

- Defense Mode

  When an attack is detected (that is, packet transmission rate exceeds the threshold value), SifoWorks automatically drops the connection, ensuring the security of the protected network.

- Monitor Mode

  SifoWorks sends a notification to administrators but does not drop the connection from which an attack was detected. The administrators must manually resolve the issue in the network.

SifoWorks supports third-party IDS devices from the Venus and NSFOCUS manufacturers. These devices can be linked to SifoWorks to provide IDS.

APPLICATION EXAMPLE

Your company wants to activate SifoWorks' IDS service to defend against attacks to the internal network. The requirements are as follows:

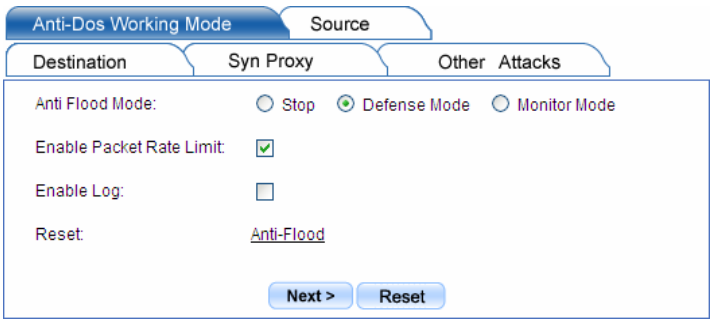
- Automatically drop connections that are detected to be transmitting attack packets
- Enable packet rate limit
- Use system default values for the various protocol connection/packet establishment rates
- Disable SYN Proxy
- Enable defense against Land-based attack and ARP spoof

The configuration procedure is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 Configure IDS working mode

1. From the left menu bar, select **"Advance > IDS Setting"**. The interface for the "*Anti-Dos Working Mode*" tab will be displayed.
2. Here, select "Defense Mode" as your device's IDS **Anti Flood Mode** and check the **Enable Packet Rate Limit** checkbox.



3. Click **[Next>]** to move to the "*Source*" tab.

Step 3 Configure the defense settings based on source addresses.

In the "*Source*" tab, keep all default settings for each field and click **[Next>]** to display the "*Destination*" tab.

Step 4 Configure the defense settings based on destination addresses.

In the "*Destination*" tab, keep all default settings for each field and click **[Next>]** to display the "*Syn Proxy*" tab.

Step 5 Configure SYN Proxy mode

In the "Syn Proxy" interface, select the **Never Proxy** option. Click **[Next>]** to move to the interface for the "*Other Attacks*" tab.

Step 6 Set up IDS defense against other types of attacks

In this interface, check the checkboxes corresponding to the **Land Attack** and **ARP Spoof** options.

Step 7 Click **[Save]** to save the IDS configurations.

UI PARAMETER REFERENCE

The tables below explains the parameters found in the various tabs in the **"Advance > IDS Setting"** interface.

"*Source*" tab

Field Name	Explanation	Configuration
Request Rate (PPS)	Maximum number of connection requests per second. A connection request refers to the first packet of each connection. You can specify request rate for different types of connections separately. The connection types include: • TCP • UDP • ICMP • Others • Total	[How to Configure] Enter the values in the textboxes.
Conn Number	Maximum allowed number of connections for each type (TCP, UDP, ICMP, Others, Total).	
Packet Rate (PPS)	Maximum number of packets that can be transmitted per second, including connection requests and other data transmission. This configuration will only be effective if **Enable Packet Rate Limit** is selected in the "*Anti-Dos Working Mode*" tab.	
From All	Total request rate, connection number and packet rate for all source addresses.	
From Single Source IP Address	The request rate, connection number and packet rate for each source IP address.	

Field Name	Explanation	Configuration
Defense-Time	When an attack is detected, SifoWorks will drop packets until the packet rate is less than the alarm threshold. Once the packet rate has decreased to less than the alarm threshold, SifoWorks will continue to drop packets for a period of time equal to the defense-time.	[How to Configure] Enter the value in the textbox. [Example] 2s
Alarm-Threshold	Alarm threshold = total threshold * **Alarm Threshold** percentage. This value is used by the system to determine when attacks occur. The system detects normal traffic (no attack) if packet rate is less than this value.	[How to Configure] Enter the value in the textbox. [Example] 80%

"*Destination*" tab

Field Name	Explanation	Configuration
Request Rate (PPS)	Maximum number of connection requests per second. A connection request refers to the first packet of each connection. You can specify request rate for different types of connections separately (TCP, UDP, ICMP, Others, Total)	[How to Configure] Enter the value in the textboxes.
Conn Number	Maximum allowed number of connections for each type (TCP, UDP, ICMP, Others, Total).	
Packet Rate (PPS)	Maximum number of packets that can be transmitted per second, including connection requests and other data transmission. This configuration will only be effective if **Enable Packet Rate Limit** is selected in the "*Anti-Dos Working Mode*" tab.	
To Single Dest IP Address	The request rate, connection number and packet rate for individual destination IP address.	

Field Name	Explanation	Configuration
Defense-Time	When an attack is detected, SifoWorks will drop packets until the packet rate is less than the alarm threshold. Once the packet rate has decreased to less than the alarm threshold, SifoWorks will continue to drop packets for a period of time equal to the defense-time.	[How to Configure] Enter the value in the textbox. [Example] 2s
Alarm-Threshold	Alarm threshold = total threshold * **Alarm Threshold** percentage. This value is used by the system to determine when attacks occur. The system detects normal traffic (no attack) if packet rate is less than this value.	[How to Configure] Enter the value in the textbox. [Example] 80%

"*Syn Proxy*" tab

Field Name	Explanation	Configuration
Syn Proxy Mode	If SYN proxy is enabled, SYN packets sent from the clients will not be forwarded. Instead, the firewall will act as the server and send a SYN-ACK packet to the client. If the client replies with an ACK packet, SifoWorks detects this connection to be valid and forwards an ACK packet to the server to complete the three-way handshake. SYN Proxy modes include: • Never Proxy Do not enable SYN proxy • Proxy the first SYN packet Enable SYN proxy only if there are no established connections in the connection list from the source address of the SYN packet. SYN Proxy will also be enabled if a connection exists but the SYN Flood threshold is exceeded • Always Proxy Enable SYN Proxy for all TCP SYN packets • Proxy only when detect SYN flood Only enable SYN Proxy if a SYN flood is detected.	[How to Configure] Click the radio button to select the corresponding option. [Range] • Never Proxy • Proxy the first SYN packet • Always Proxy • Proxy only when detect SYN flood

"*Other Attacks*" tab

Field Name	Explanation	Configuration
Land Attack	Enable or disable defense against Land attacks. Land attacks refer to the sending of TCP SYN packets continuously from the attacker to the host being attack. These packets have identical IP source and destination addresses, TCP source and destination ports. This causes the attacked host to send reply packets to itself repeatedly, causing it to crash or reboot due to the large traffic load.	[How to Configure] Check the checkbox to enable.
ARP Spoof	Enable or disable defense against ARP Spoof attacks. ARP spoof attacks uses fake IP and MAC addresses to deceive the ARP mechanism, generating large amounts of ARP packets to choke the network or achieve "man in the middle" to carry out ARP redirection and sniffer attacks.	

Field Name	Explanation	Configuration
Smurf	Enable or disable defense against Smurf attacks. Smurf attacks combine IP Spoof and ICMP echo-reply methods to flood the targeted system with large amount of network transmissions, causing the system to deny services to other legitimate systems. Smurf attacks sends large number of ICMP packets (mainly reply packets for the Ping command) to the broadcast address of a midware proxy. The IP address of the host being attacked is used as the source IP of these packets. The midware proxy will then send the packets to all hosts in its subnet, causing the target host to crash.	[How to Configure] Check the checkbox to enable.
Replay Attack	Enable or disable defense against Replay attacks. When enabled, SifoWorks will be able to identify and block intercepted packets sent by the attacker, thus preventing Replay attacks. Replay attacks refer to the sending of packets that were intercepted by the attacker, thus allow access to the resources of the system being attacked.	

Field Name	Explanation	Configuration
WinNuke	Enable or disable defense against WinNuke. SifoWorks identifies and blocks encrypted attack packets, thus preventing WinNuke attacks. WinNuke attacks involve sending TCP fragments to an already connected host (usually to NetBIOS port 139 configured with the emergency symbol URG), resulting in duplicate NetBIOS fragments. This causes systems using Windows to crash.	
IP Fragment Attack (TearDrop/Bonk…)	Enable or disable defense against IP Fragment type attacks. The that can be detected by SifoWorks are: • TearDrop • Bonk • Boink • Nestea • Newtear • Syndrop • Jolt2 • Oshare • Saihyousen • 1234 • Ping of death Note: The IP header of an IP packet contains two bytes representing the length of the IP packet. The longest length of any IP packet is 0xFFFF (65535bytes). Processing of IP fragments larger than this length will cause errors to occur in certain systems, thus causing the system to deny services. Also, some systems will not be able to process IP fragments if the offset of the different fragments have been specifically structured, causing the systems to crash.	[How to Configure] Check the checkbox to enable.

7.6 Upgrade Intelligent Recognized Protocols (IRP)

SifoWorks supports updating of IRP by importing protocol recognition update patch files. This updates the system to recognize protocols that are newly developed or modified, thus enhancing the stability of the firewall. This section guides you through the procedure to update SifoWorks' IRP function.

For more information on the IRP function, please refer to "1.3.4 Intelligent Protocol Recognition".

CONFIGURATION PROCEDURE

The procedure to update SifoWorks' IRP function is as follows:

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **"Advance > IRP Upgrading"**.

Step 3 Click **[Browse]** and select the update file to be imported.

Step 4 Click **[Save]** to begin importing the file to update the system's IRP function.

Step 5 From the left menu bar, select **"System > Common Setting"**. Click to display the "*Advanced Options*" tab.

Step 6 Click the **[Reboot System]** button to restart the SifoWorks device.

Chapter

8

Log Management

This chapter includes the following sections:

- Overview

  Introduces SifoWorks' log management function, briefly explaining the various log levels, log types and the log storage methods.

- Managing Log Servers

  Details how to set up remote log servers (up to 4 remote servers) and limit the number of log records that can be generated per second.

- Configuring Log Attributes

  Explains the configuration of various log attributes including the maximum number of logs to store for each log type, log deletion policy, whether to log DNS/ICMP request and whether to log packets that did not match any filter rule.

- Exporting Log

  Introduces the log export function to backup logs to FTP servers.

- Customizing Log Filter Criteria and Log Format

  Describes how to customize the filter criteria and format of logs that are stored locally (LocalDB), remotely (Server 1 – Server 4), sent in emails (Email Alert) or exported to a FTP server (Export).

- Setting up Email Alerts

  Explains how to enable SifoWorks log email alert function, sending specific logs to an email address periodically.

- Viewing Logs

  Describes how to view the various types of logs including admin, system, security and traffic logs.

Please refer to this chapter to understand log related operations.

8.1 Overview

SifoWorks records and displays comprehensive log information, helping administrators monitor the system's status and identify abnormalities in the network. SifoWorks' provides 4 ways to store log records:

- Local Storage (LocalDB)

  Store logs using the SifoWorks' inbuilt hard-disk.

- Remote Server (Server 1 – Server 4)

  SifoWorks can be connected to up to 4 remote log servers at the same time. For each server, you can specify the IP address, listening port, log format and the protocol used to transmit the log files. You can also select the character encoding set used to record logs.

- Email (Email Alert)

  Send log records fulfilling certain criteria to specified email addresses.

- FTP Server (Export)

  Export log files into a FTP server by configuring the export path, log format and time interval between each export operation.

Using the system's log filtering mechanism, you can customize the log filter criteria and format of logs to be stored using each of the storage methods above.

SifoWorks categorizes logs based on both log type and level for ease of management. The system categorizes all logs using a total of 8 log levels and 4 log types.

Log Levels

The system log levels are listed below in ascending order of importance:

- Debug
- Info
- Notice
- Warn
- Error
- Critical
- Alert
- Emerg

Log Types

- Admin Log

  Records administrative operations performed on the SifoWorks systems. This includes changes to network configuration, adding of objects etc.

- System Log

  Log records related to system operation status such as enabling a function module, HA device swap etc.

- Security Log

  All logs related to attacks on the network detected by SifoWorks such as attacks detected by the IDP module etc.

- Traffic Log

  Logs all packets transmitted through SifoWorks such as a connection establishment, data packets allowed to pass through the firewall etc.

8.2 Managing Log Servers

This section explains how to set up connection to up to 4 remote log servers (Server1 – Server4) for the SifoWorks system. You can also control log traffic, specifying the maximum number of logs that can be stored per second.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu column, select **"Log > Log Server"**.

Step 3 (Optional) Enable log traffic control

1. From the "Throughput Setting" region of this interface, check the **Enable** checkbox.
2. Enter the maximum number of logs that can be stored per second in the **Item/s** field.

Step 4 Enable and configure syslog Server1 setting.

1. In the "Log Server List" area of the **"Log > Log Server"** interface, click the icon corresponding to "server1".
2. Enter the **Server Name**, **IP** address, listening **Ports**, log **Format**, and **Protocol** used to export logs from SifoWorks to the server.
3. Select the **Charset** format used to store the logs.
4. Check the **Enable** checkbox to enable the use of this remote server.
5. Click **[Save]** to save the configuration.

Step 5 (Optional) Repeat step 4 to configure Server2 – Server 4.

8.3 Configuring Log Attributes

Here you can set up specific log attributes such as the maximum number of log records to store for each log type, when and which logs to delete, whether to log DNS/ICMP requests etc.

Note:

The policy to delete logs sets up the system such that when the number of log records exceeds the specified maximum, the system will automatically delete a percentage of the logs. Logs are deleted according to their generated date. The earliest logs will be deleted first.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Log > Log Global"**.

Step 3 In the displayed interface, configure the log attributes as required.

For example, enter "50000" as the **Max Items** of "admin" logs and "10%" as the corresponding **Del Policy**. The system will thus store up to 50000 admin logs. When this number is exceeded, the system will automatically delete 10% of the stored admin logs, that is, the oldest 5000 admin log records.

Step 4 (Optional) Select whether to log DNS request, ICMP request and/or packets that did not match any filter rules.

For example, to log all DNS requests, check the checkbox at the front of the **Log Every DNS Request** option.

Step 5 Click **[Save]** to save the configuration.

8.4 Exporting Log

This section explains how to set up the system to export logs to a FTP server for archive purposes.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write account.

Step 2 From the left menu bar, select **"Log > Log Export"**.

Step 3 From the "Log Export" interface that is displayed, check the **Export Enable** checkbox.

Step 4 Enter the domain name of the **Ftp server**, full file **Path** to store the log files to, the **User** name and **Password** used to login to the FTP server,

log storage **Format** and the **Interval** (in terms of time or number of log items) between each export operation.

Step 5 Click **[Save]** to save the configuration.

8.5 Customizing Log Filter Criteria and Log Format

By configuring log filter criteria and format, you can customize the logs that are stored using each storage method (local storage, remote server, emails, FTP server) independently. You can also specify the format of logs stored via each of this method.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks using a read/write administrator account.

Step 2 From the left menu bar, select **"Log > Log Filter"**.

Step 3 (Optional) Define customized log filter criteria

1. Click the "*Log Filter*" tab. Click the icon corresponding to the type of logs you want to customize filtering criteria for.

   For example, to configure filter criteria for logs stored to the remote server1, click the icon corresponding to server1 in this interface.

2. Select the log type from the **Log Category** field. Then, select the log **Level**(s) to include. Also select the SifoWorks' function **Module**(s) to store logs for.
3. Click **[Save]** to save the configuration and return to the "*Log Filter*" tab interface.

Step 4 (Optional) Customize log format

1. From the **"Log > Log Filter"** interface, click to display the "*Customize Log Format*" tab.
2. Here, select the function module from the **Module** field. Next, select the information to include in logs generated from the selected module.
3. Click **[Save]** to save the configuration.

8.6 Setting up Email Alerts

Setting up mail alerts including parameters such as the email address used to receive the specified log records, the time interval between the sending of each mail etc.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu column, select **"Log > Email Alert"**.

Step 3 In the *"Email Alert"* tab displayed, enable **Email Alert**.

Step 4 Click **[Next>]** to navigate to the *"SMTP Server Setting"* tab.

Step 5 Enter the **SMTP Server IP** address, and the account information to login to the SMTP server (**User Mail Address**, **Password**).

Step 6 Click **[Next>]** to navigate to the *"Email Setting"* tab.

Step 7 Enter the email address used to receive the log alerts in either **Email1** or **Email2**. Specify the **Interval** (in terms of time or number of log items) between the sending of each alert.

Step 8 Click **[Save]** to save the configuration.

8.7 Viewing Logs

This section includes information on how to query and view the various log lists including admin log, system log, security log and traffic log.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks.

Step 2 From the left menu bar, select the sub-menu option under the menu **"Log"** corresponding to the type of log you wish to view.

For example, to view administrative logs, select **"Log > Admin"**.

Step 3 At the top of the log list, specify query criteria to search for specific log records.

You can click **"Advanced"** to enter more specific search criteria.

Step 4 Click **[Go]** to search for and display the list of logs fulfilling the specified criteria.

Step 5 (Optional) For log lists that span more than a single page, use the **Go To** drop down menu to view the other pages.

Chapter

9

System Settings

The following sections can be found in this chapter:

- Overview

  Briefly introduces the various operations relating to system setting configurations.

- Managing Administrator Accounts

  Explains how to manage administrator accounts via the SifoWorks UI and the various administrator access authorities.

- Setting Up Basic System Configuration

  Introduces the system date/time, display language, password recover mechanism configurations.

- Import/Export Configuration File

  Describes, in detail, how to save the current system configurations into a backup file, and how to import a previously backup configuration file to restore the system's settings.

- Upgrade System Software

  Explains how to upgrade the system's software.

- Connect to a Network Management System

  Guides you through the procedure to set up SNMP proxy, SNMP trap and registration server to connect SifoWorks to a centralized network management system.

- Configuring Timeout Values

  Explains the various timeout parameters and how to specify timeout values to raise system's performance.

You should refer to this chapter when you want to perform operations related to the configuration of various system settings.

9.1 Overview

This series of operations guides you through setting up SifoWorks' normal operating environment. This includes managing administrator accounts, basic system configurations, managing configuration files, upgrading system software, configuring timeout etc.

9.2 Managing Administrator Accounts

This function allows you to add, edit or delete administrators. You can also set up attributes such as number of allowed login retries and the lock duration for each account.

The system default administrator (Root User) account is "admin" with password "admin123". This account can access all system functions and cannot be deleted.

All user-defined administrator accounts can be authorized to access different system functions according to their assigned authority level. Two types of administrators can be added:

- Normal Administrators

  These administrators are able to view and manage most of the system's functions including network settings, firewall rules, VPN, IDP, log and report etc. Normal administrators are not able to modify other administrator accounts, upgrade system software and import configuration files. (These functions are only accessible by the default "admin" account.)

  Normal administrators can be assigned with one of two operation authority including:

  - Read-only

    These administrators can view but cannot modify any system configurations.

  - Read/Write

    These administrators can view and modify the accessible system configurations.

- Auditor Administrators

  These administrators are able to view system logs, reports and system status displayed on the UI's **"Home"** page. Auditor administrators are mainly involved in analyzing the system and network operating status.

Hence, the authority assigned to each account type can be illustrated as follows (from highest authority level to lowest authority level):

Root Administrator (“admin”) > normal read/write administrators > normal read administrators > auditor administrators.

Note:

Only the default administrator account “admin” can manage other administrator accounts. All other accounts are only allowed to modify their own account password.

APPLICATION EXAMPLE

A system administrator assigned with the “admin” account, wants to add a read/write account for a maintenance engineer to allow him to manage the system’s network configurations and filter rules.

He thus adds an account with username “admin1”, password “12345678”. This account is allowed to login to the system via OTP.

The configuration procedure is as follows:

Step 1 Login to the system via the “admin” account.

Step 2 From the left menu column, select **“System > Admin Setting”** to view the list of administrator accounts.

Step 3 Click **[Add New AdminUser]**.

Step 4 From the “Add New AdminUser” interface displayed, enter the following information:

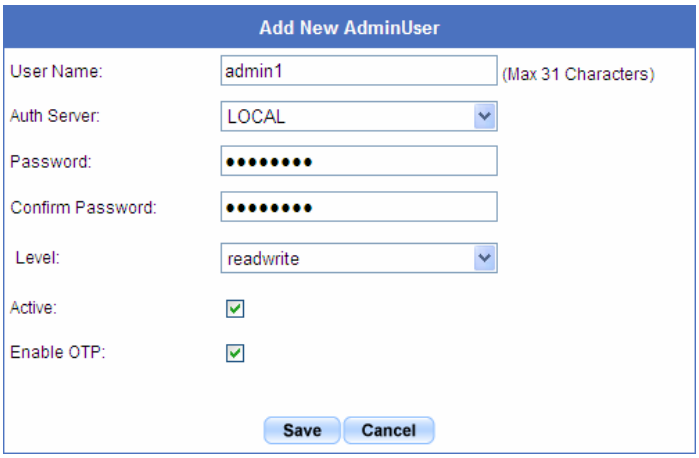
User Name: admin1

Auth Server: Local

Password and **Confirm Password:** 12345678

Level: readwrite

Select **Active** and **Enable OTP**.



Step 5 Click **[Save]** to save the new administrator account.

UI PARAMETER REFERENCE

The tables below explain the configuration parameters found in the "**System > Admin Setting**" interface.

[Add New AdminUser] / [Add New Auditor]

Field Name	Explanation	Configuration
User Name	Name of the administrator account	[How to Configure] Enter the character string in the textbox. [Range] String of characters of length between 1-31 [Example] admin1
Auth Server	The authentication server used to authenticate this administrator. You can add authentication servers from the **"System > Auth Server"** interface. Select "LOCAL" to authenticate this user locally.	[How to Configure] Select the server from the drop down menu. [Range] All authentication servers added in the "System > Auth Server" interface. [Default] LOCAL
Password / Confirm Password	Account password	[How to Configure] Enter the value in the textbox. [Range] Character string of length 6-15. [Example] 12345678

Field Name	Explanation	Configuration
Level	Access authority for this account. The options include: • read-only Able to view but not modify any system configurations. • readwrite Able to view and modify system configurations except for management of other administrator accounts. Note: This is only available in the "Add New AdminUser" interface	[How to Configure] Select the access level from the drop down menu. [Range] • read-only • readwrite [Default] read-only
Active	Whether this administrator account can login to the system.	[How to Configure] Check the checkbox to enable this account.
Enable OTP	Whether this account can login via OTP method. For more information on OTP login, please refer to "2.2.1 System Login, Configuration Procedure – OTP Login"	[How to Configure] Check the checkbox to enable OTP login

"*Login Management*" tab

Field Name	Explanation	Configuration
Retry Times	The maximum number of times a user's login attempt can fail. If the user fails to login successfully within this number of tries, his account will be locked for a period of time.	[How to Configure] Enter the value in the textbox. [Range] 2-100 [Default] 3
Timeout	The amount of time allowed during each login retry after which the login attempt will timeout. This field is used in conjunction with the **Retry Times** field above.	[How to Configure] Enter the value in the textbox. [Range] 30-300s [Default] 120
Bind IP	Select whether to bind a user's login retries to the IP address. If enabled, the number of retries will be computed for the same IP address only; Otherwise, the number of retries is applicable to all IP addresses. That is, login failure will count towards the number of retries regardless of the IP address from which the user is logging in.	[How to Configure] Check the checkbox to enable bind IP. [Default] Disabled.
Freeze Duration	Period of time an account will be locked by the system.	[How to Configure] Enter the value in the textbox. [Range] 30-600s [Default] 180

9.3 Setting Up Basic System Configuration

Basic system configurations include selecting the UI display language, setting up system date/time, enabling the password recovery mechanism, and specifying the timeout value for the web UI.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"System > Common Setting"**.

Step 3 You can click on any of the tabs (*"Misc Setting", "Date Setting", "Advanced Options", "Web Server Cert"*) in this interface and configure as necessary.

Step 4 Click **[Save]** to save your settings.

UI PARAMETER REFERENCE

The tables below explain the parameters that can be configured on the various tabs of the **"System > Common Setting"** interface.

"*Misc Setting*" tab

Field Name	Explanation	Configuration
Web Time Out	Timeout setting to enhance system security. If no operations are made by a user on the system's web UI during this time, the system automatically disconnects the user.	[How to Configure] Enter the value in the textbox [Range] 60-3600s [Example] 300
Enabled Password Recover	Select whether to enable SifoWorks' password recovery mechanism. To recover the default password, press and hold the "Reset" button (located between MGT0 and the power LED on the device's front panel) for at least 10 seconds using a thin wire.	[How to Configure] Check the checkbox to enable.

Field Name	Explanation	Configuration
Language Selection	Select the UI display language	[How to Configure] Select from the drop down menu. [Range] • Simplified Chinese • English • Traditional Chinese

***"Date Setting"* tab**

Field Name	Explanation	Configuration
Current Date and Time	Configure the system's date and time	[How to Configure] Enter the value in the textbox. [Example] 2008-07-20 13:41:55

"Web Server Cert" tab

Field Name	Explanation	Configuration
New Cert File	Full path of the certificate file to be imported.	[How to Configure] Enter the value in the textbox or click **[Browse]** and select the file.
Key File	Full path of the key file corresponding to the certificate to be imported	[How to Configure] Enter the value in the textbox or click **[Browse]** and select the file.
Passphrase/ Retype Passphrase	Password used when generating the certificate file to be imported	[How to Configure] Enter the value in the textbox.

9.4 Import/Export Configuration File

This function allows you to save the current system configurations into a backup file or restore the system configurations from a previously saved file.

Note that only the root user, “admin”, is able to import a previously saved configuration file to restore the system configurations. All normal “read/write” users will be able to export system configurations to a file.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks using the “admin” account.

Step 2 From the left menu column, select **“System > Config File”**.

Step 3 From this interface, you can:

- To save the current system configurations to a file, select the *“Save System Configuration to File”* tab and click **[Save To File]**. Select the local directory path and file name to save the current system configurations to.
- To upload a previously saved configuration file to the current system, select the “*Upload Configuration To System*” tab. Click **[Browse]** and select the file to upload. Click **[OK]** to begin uploading the file.

MAINTENANCE RECOMMENDATIONS

You are recommended to backup system configurations periodically or before modifying any important configurations to facilitate the maintenance and handling of system errors.

9.5 Upgrade System Software

This function allows you to upgrade your system's software version. Note that you must have first obtained the upgrade file and corresponding file password before performing this operation.

Only the root user, "admin", can perform this operation.

CONFIGURATION PROCEDURE

⚠ Warning:

Please do not perform any other operations on SifoWorks, disconnect the device's power source or shutdown the device during the update process to prevent unpredictable system failures.

Step 1 Disconnect all network cables from the device's data ports.

Step 2 Login to SifoWorks via the "admin" account.

Step 3 From the left menu bar, select **"System > Patch Setting"**.

Step 4 Click **[Browse]** to select the update patch file.

Step 5 Enter the **Password** for the selected file.

Step 6 Click **[Save]** to begin the update. Please wait until the update completes.

Step 7 Re-connect all data ports that were disconnected during Step 1.

9.6 Connect to a Network Management System

SifoWorks uses the standard SNMP (Simple Network Management Protocol) to design its SNMP interface module, allowing the system to be connected to a central network management system such as O2Security's SifoView system or other third-party network management systems.

To enable management of SifoWorks via a network management system, you must enable SNMP proxy and configure accordingly. You can also select to configure SNMP Trap and the registration server if necessary.

SNMP Protocol

The simple network management protocol is designed specifically for the management of network elements (such as servers, workstations, routers, switches etc.) within an IP network. SNMP is an application layer protocol and is encapsulated within UDP.

There are three SNMP versions, v1, v2c and v3. Version v2c's access capability is enhanced from v1 while version v3 includes an additional encryption authentication mechanism. SifoWorks supports all 3 SNMP versions.

SNMP Agent

This refers to the network element being managed, such as SifoWorks.

Community

Community is a local SNMP proxy concept used to define the relationship between the SNMP manager (the network management system) and the SNMP agent.

SNMP v1 and v2c incorporates this "Community" concept, with the community name equivalent to being a password used to restrict accesses to the SNMP agent by the SNMP manager.

Multiple communities can be defined for each SNMP agent. The name of each community must be unique. Each SNMP community defines the authentication and access control communications between a SNMP agent and multiple SNMP managers.

SNMP Trap

Configure SNMP Trap to enable the system to notify the specified server when errors occur in its operation status. A SNMP Trap packet generally indicates an error or a warning status such as performance issues or interface abnormalities. SifoWorks supports SNMP traps based on SNMP v1 and v2c.

By configuring SNMP Trap, the specified server will be able to obtain prompt notice when any abnormalities occur in the SifoWorks device's operating status.

Registration Server

This refers to the server on which the network management system is installed. Configuring registration server allows the network management system (such as O2Security's SifoView) to automatically discover and manage the SifoWorks device.

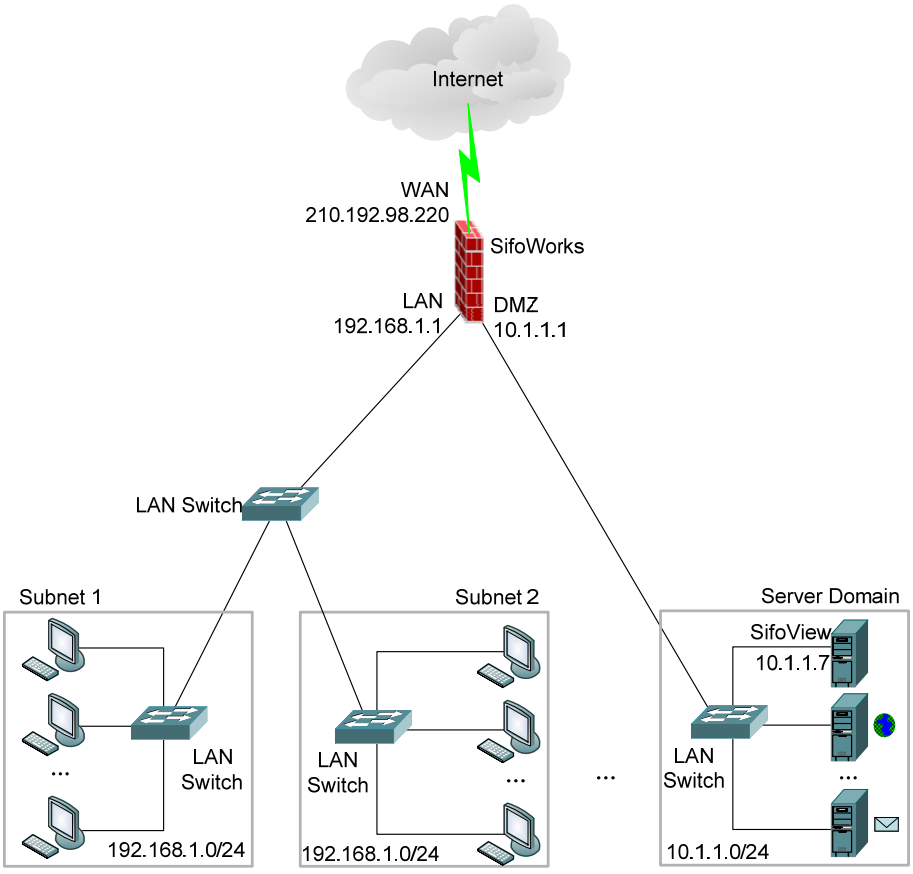
Note:

Please ensure that your device's network configuration has been properly set up before attempting to connect SifoWorks to a network management system. Please refer to "3.2 Setting up the Basic Network Settings" for details on configuring SifoWorks network settings.

APPLICATION EXAMPLE

The company uses the SifoView network management system to manage all network devices deployed within its network. A new SifoWorks device is then deployed into the network. The SifoWorks system administrator wants to set up the device such that it can be managed via SifoView.

The topology of this network is illustrated in the figure below.



In this network,

- IP address of the SifoView server is 10.1.1.7
- The SifoView server is located in DMZ
- IP address of the SifoWorks VLAN representing DMZ is 10.1.1.1

- Enable SNMP v3 with security level “AuthPriv”. This allows administrators to configure SifoWorks via SifoView
- SNMP Trap is not needed

The configuration procedure is as follows:

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 Add SNMP Proxy

1. From the left menu bar, select **“System > SNMP Setting”** to view the SNMP list.
2. From the top left corner of this list, select to enable (“On”) the system’s **SNMP Status**.
3. Click **[Add New SNMP]**.
4. In the interface displayed, configure as follows:

   SNMP Version: V3

   Sec Name: SifoView

   Sec Level: AuthPriv

   Auth Protocol: HMAC-MD5-96
5. Enter the authentication and privacy passwords in the **Auth Password/Retype** and **Priv Password/Retype** textboxes respectively.
6. Click **[Save]** to save the SNMP proxy.

Step 3 Add Registration Server

1. From the left menu bar, select **“System > Registration Server”**.
2. At the bottom of the list displayed, click **[Add Registration Server]**.
3. In the interface displayed, configure as follows:

   Server Name: SifoView

   Enable: On

   IP: 10.1.1.7

   Port: 666

   Interval: 60

   Bind IP: 10.1.1.1
4. Click **[Save]** to save the new registration server record.

UI PARAMETER REFERENCE

The tables below explain the parameters you may need to configure when setting up SifoWorks to be monitored and/or configurable from a centralized network management system. This includes the **"SNMP Setting"**, **"SNMP Trap"** and **"Registration Server"** configuration interfaces.

"System > SNMP Setting > [Add New SNMP]"

Field Name	Explanation	Configuration
SNMP Version	SNMP protocol version to use.	[How to Configure] Click the radio button to select the version. [Range] • v1/v2c • v3
Community Name	Only available if SNMP v1/v2c versions are selected. SNMP v1/v2c uses community name authentication.	[How to Configure] Enter the value in the textbox. [Range] String of 1-15 characters.
Sec Name	Only available if SNMP v3 is selected.	[How to Configure] Enter the value in the textbox. [Range] String of 1-15 characters.
Sec Level	Only available if SNMP v3 is selected. There are three security levels: • Noauthnopriv Does not require authentication, private key and passwords • Authnopriv Requires authentication and password but not private key • AuthPriv Requires authentication and password along with private key	[How to Configure] Select the option from the drop down menu. [Range] • Noauthnopriv • Authnopriv • AuthPriv

Field Name	Explanation	Configuration
Auth Protocol	Only available if SNMP v3 and the “Authnopriv” or “AuthPriv” **Sec Level** is selected.	[How to Configure] Select the protocol from the drop down menu. [Range] • HMAC-MD5-96 • HMAC-SHA-96
Auth Password/Retype	Only available if SNMP v3 and the “Authnopriv” or “AuthPriv” **Sec Level** is selected. This is the password used for authentication.	[How to Configure] Enter the value in the textbox. [Range] String of 8-15 characters.
Priv Protocol	Only available if SNMP v3 and the “AuthPriv” **Sec Level** is selected.	[How to Configure] Uses “DES” by default. This value cannot be modified.
Priv Password/Retype	Only available if SNMP v3 and the “AuthPriv” **Sec Level** is selected. This is the encryption key used by the privacy protocol.	[How to Configure] Enter the value in the textbox. [Range] String of 8-15 characters.

"System > SNMP Trap > [Add New SNMP Trap]"

Field Name	Explanation	Configuration
Version	SNMP protocol version.	[How to Configure] Select the version using radio buttons. [Range] • v1 • v2c
Host IP	IP address of the Trap recipient.	[How to Configure] Enter the value in the textbox.
Host Port	Port number of the Trap recipient.	[How to Configure] Enter the value in the textbox. [Default] 162
Local IP	This refers to the bind IP or the IP address of the SNMP Trap sender. This address is included in the Trap packet to allow recipients to obtain the source IP address of the Trap sender even if the packets were processed via NAT.	[How to Configure] Enter the value in the textbox.
Community	Community name used for authentication.	[How to Configure] Enter the value in the textbox. [Default] public
Type	Only available if SNMP v2c is selected. There are two types of SNMP traps: • trap Asynchronous transmission of SNMP Trap packets. The reliability of the packets cannot be guaranteed. • Inform Synchronous transmission of SNMP Trap packets. The system will wait for a response from the receiving host after transmitting the packet.	[How to Configure] Select the option from the drop down menu. [Range] • trap • inform

“System > Registration Server > [Add Registration Server]”

Field Name	Explanation	Configuration
Server Name	Name of the server.	[How to Configure] Enter the value in the textbox. [Range] String of 1-15 characters.
Enable	Enable or disable the use of this server. Note that if the **SNMP Status** in the **“System > SNMP Setting”** interface is disabled, this function will not be enabled even if this value is “On”.	[How to Configure] Select the “On” or “Off” radio button to enable or disable this function respectively. [Range] • On • Off
IP	IP address of the network management server.	[How to Configure] Enter the value in the textbox.
Port	UDP listening port of the network management server.	[How to Configure] Enter the value in the textbox. [Range] 1-9999
Interval	The time interval between each sending of information packets from the system to the network management server.	[How to Configure] Enter the value in the textbox. [Range] 1-100s
Bind IP	IP address of SifoWorks’ data port. This allows the network management system to correctly identify the packet source even if packets have been processed via NAT.	[How to Configure] Enter the value in the textbox.

9.7 Configuring Timeout Values

Configuring the various timeout values helps to raise system performance. SifoWorks is configured with a series of default timeout values determined by studying the actual network requirements of most networks. Generally, we do not recommend modifying any timeout value. You may wish to contact O2Security's technical assistance personnel if you want to modify these values.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"System > Timeout Setting"**.

Step 3 Modify the settings in the *Timeout Setting* and/or *Aggressive Aging Settings* tabs accordingly.

Step 4 Click **[Save]** to save your configurations. A success message should be displayed.

UI PARAMETER REFERENCE

The table below explains the parameters found in this two-tabbed interface.

"*Timeout Setting*" tab

Field Name	Explanation	Configuration
Generic Timeout	Timeout value for all protocols other than ICMP, TCP and UDP	[How to Configure] Enter the value in the textbox. [Range] 500s
ICMP Timeout	Timeout for all ICMP packets.	[How to Configure] Enter the value in the textbox. [Range] 30s

Field Name	Explanation	Configuration
TCP Timeout	CLOSE: Timeout value when the TCP connection is in the CLOSE state	[How to Configure] Enter the value in the textbox. [Range] 10s
	CLOSE-WAIT: Timeout value when the TCP connection is in the CLOSE-WAIT state	[How to Configure] Enter the value in the textbox. [Range] 600s
	ESTABLISHED: Timeout value when the TCP connection is in the ESTABLISHED state	[How to Configure] Enter the value in the textbox. [Range] 600s
	FIN-WAIT: Timeout value when the TCP connection is in the FIN-WAIT state	[How to Configure] Enter the value in the textbox. [Range] 120s
	LAST-ACK: Timeout value when the TCP connection is in the LAST-ACK state	[How to Configure] Enter the value in the textbox. [Range] 30s
	TIME-WAIT: Timeout value when the TCP connection is in the TIME-WAIT state	[How to Configure] Enter the value in the textbox. [Range] 120s
UDP Timeout	Timeout value for single-directional UDP connections	[How to Configure] Enter the value in the textbox. [Range] 30s
UDP Stream Timeout	Timeout for bi-directional UDP connections	[How to Configure] Enter the value in the textbox. [Range] 180s

"*Aggressive Aging Settings*" tab

Field Name	Explanation	Configuration
Low-Watermark	Do not activate aggressive aging if the % of currently established sessions against the maximum number of sessions supported by the system is less than this value.	[How to Configure] Enter the value in the textbox. [Default] 70%
High-Watermark	Activate aggressive aging if the % of currently established sessions against the maximum number of sessions supported by the system is greater than this value.	[How to Configure] Enter the value in the textbox. [Default] 85%
Percent of Timeout	When aggressive aging is activated, delete a session if the % of its idle time against its timeout is greater than this value.	[How to Configure] Enter the value in the textbox. [Range] 30%

Chapter

10

System Maintenance

This chapter includes the following sections:

- Overview

  Briefly lists the various system maintenance tools provided by SifoWorks.

- Monitoring Sessions and Online Users

  Detailed explanation on how to view and manage the list of established sessions, list of authenticated users that are currently online, DHCP lease information.

- Viewing Reports

  Introduces the system's reporter function including how to enable/disable the reporter, and view various real-time and/or history reports detailing the various system statuses.

- Performing Network Diagnostics

  Explains the various network diagnostic tools including Ping and Traceroute supported by the system to check for network connectivity.

- Restoring System Settings

  Describes how to restore the system settings to factory default, retrieve administrative IP address or restore the default administrator's password to help you restore SifoWorks in the event of system failures.

Please refer to this chapter when performing various system maintenance operations.

10.1 Overview

This chapter introduces the various system maintenance tools provided by SifoWorks to help administrators monitor and manage the system to ensure stability. These tools include online sessions and user monitoring, reports and system restoration methods.

10.2 Monitoring Sessions and Online Users

This section explains how to monitor or manually terminate currently established sessions and authenticated online users and to view DHCP lease information.

10.2.1 Sessions

Refers to the series of operations executed through a connection established between two peers. SifoWorks supports access control based on session status. Administrators can view various information of all sessions currently established and monitored by SifoWorks including source and destination IP, protocol used, corresponding protocol characteristics, when the session was established and how long the session was maintained for.

CONFIGURATION PROCEDURE

The procedure to manage the list of currently established session is described in the steps below.

Step 1 Login to SifoWorks via an administrator account.

Note:

If you are only intended to view session information, simply login to SifoWorks via a read-only administrator account. If you need to manually terminate sessions, please login with a read/write account.

Step 2 From the left menu bar, select **"Monitor > Session"** to view the list of currently established sessions.

Step 3 From this list, you can:

- Search for specific sessions

  Click **[Query]**. In the "Query Session" interface, specify search criteria and click **[Search]** to search for specific sessions.

- Export the session to a local file

  Click **[Save]** export the session list to a file to be stored locally.

- Terminate specific sessions

  Click **[Delete]**. In the "Delete Session" interface, specify the necessary criteria and click **[Delete]** to terminate all sessions matching these criteria.

10.2.2 Online Users

Refers to all currently online users who have been successfully authenticated. Users can be added via the **"System > Auth User"** interface to be locally authenticated by SifoWorks. Users can also be authenticated via remote RADIUS, LDAP or AD servers.

CONFIGURATION PROCEDURE

The procedure to view/manage the lists of currently established session, online users and DHCP lease via the SifoWorks interface is described in the steps below.

Step 1 Login to SifoWorks via an administrator account.

Note:

If you are only intended to view the list of online users, simply login to SifoWorks via a read-only administrator account. If you need to manually disconnect users, please login with a read/write account.

Step 2 From the left menu bar, select **"Monitor > Online Users"**. The list of authenticated users currently online will be displayed.

Step 3 From this list, you can:

- View various information for each online user.
- Click **[Refresh]** to refresh the list of online users.
- Click **[Disconnect]** from the **Operation** column to disconnect the corresponding user.

10.2.3 DHCP Lease

Refers to the list of IP addresses leased to clients by DHCP servers. This list also displays each host's MAC address, starting and ending lease time etc.

CONFIGURATION PROCEDURE

The procedure to view/manage the lists of currently established session, online users and DHCP lease via the SifoWorks interface is described in the steps below.

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu bar, select **"Monitor > DHCP Lease"**.

Step 3 The list of IP addresses leased to various hosts by the DHCP server(s) will be displayed. You can view DHCP lease information directly from this list.

10.3 Viewing Reports

This section describes how to enable/disable the SifoWorks' reporter module and view various real-time and history reports detailing the system's operating status.

SifoWorks generates reports for 5 different types of statistics including system resource status, traffic, IP traffic statistics, number of sessions and session establishment rate. The following sections explain each of these reports in detail.

📖 Note:

Your administrative host must be installed with JRE 1.6.0 or above to view the reports generated by SifoWorks using the system's UI.

10.3.1 Reporter Configuration

You can configure whether to enable or disable the system to generate the various reports for monitoring purposes.

CONFIGURATION PROCEDURE

The following steps explain how to configure the system's Reporter module.

Step 1 Login to SifoWorks via a read/write administrator account.

Step 2 From the left menu bar, select **"Reporter > Reporter Setting"**.

Step 3 In the "Reporter Setting" interface that displays, you can:

- Disable monitoring of system activities using reports

  Select the **Disable Reporter** radio button to disable SifoWorks' Reporter module. The system will discard all previously saved data that were used to generated reports.

- Enable monitoring of the system using reports and select the types of reports to generate

  Select the **Enable Reporter** radio button to enable the Reporter module. To enable all types of reports, select the **ALL** radio button. Otherwise, select the **Options** radio button and check the checkboxes corresponding to the types of reports to generate.

Step 4 Click **[Save]** to save the settings.

10.3.2 System Status Reports

These reports detail utilization of various system resources including CPU, Memory and RAM utilization status. Two reports are generated for each system resource including a report generated using statistics from the past 1 hour and a history report generated using statistics from any previous 7 days interval.

CONFIGURATION PROCEDURE

The procedure below explains how to view the system status reports. It also describes the various options available when viewing these reports.

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu bar, select **"Reporter > System Status"**.

Step 3 By default, the system displays the "*CPU Status*" report. You can click the "*MEM Status*" or "*Ramdisk*" tabs to view the reports for memory or RAM utilization respectively.

Step 4 Select whether to view current reports (statistics from the past 1 hour) or history reports (statistics from any past interval of up to 7 days).

- View report generated using statistics for the last 1 hour

  Click the **Current Monitor (Listen Current 1Hours)** radio button to view the chart generated based on statistics collected from the past 1 hour.

- View report generated using statistics from any past interval up to 7 days

  Manually select the time interval to generate the report for by selecting the **History Query(Listen Past 7Days)** radio button. In the **From** and **TO** date/time textboxes that appear, specify the starting and ending time of the desired time interval to view the history report generated based on statistics collected during this period. Note that the maximum time interval you can enter is 7 days.

Step 5 Click **[Go]** to refresh the interface to display the graph according to your settings in step 4.

10.3.3 Traffic Reports

These reports are generated based on the total traffic (inbound/outbound/bi-directional) transmitted via SifoWorks. Individual traffic reports for each network port are also generated.

The system generates traffic reports using statistics collected from the past 1 hour. You can also view history traffic reports that were generated using statistics from any previous 7 days interval.

CONFIGURATION PROCEDURE

The procedure below explains how to view the traffic reports generated by SifoWorks. It also describes the various options available when viewing these reports.

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu bar, select **"Reporter > Traffic"**.

Step 3 Select whether to view traffic reports for the overall system (all interfaces) or for individual interfaces.

- View traffic reports for individual interfaces

  Click the **Interface Traffic** radio button and select the corresponding **Interface** from the adjacent drop down menu. Also select whether to include the charts for inbound, outbound and/or total traffic in the report. Click **[Go]** to generate the corresponding report.

- View overall traffic reports

  Select the **Total Traffic** radio button. From the options that appear, select whether to view the chart for bi-directional traffic ("**Over**"), incoming traffic ("**Inbound**") or outgoing traffic ("**Outbound**").

Step 4 Select whether to view current reports (statistics from the past 1 hour) or history reports (statistics from any past interval of up to 7 days).

- View report generated using statistics for the last 1 hour

  Click the **Current Monitor (Listen Current 1Hours)** radio button to view the chart generated from statistics collected in the past 1 hour.

- View report generated using statistics from any past interval up to 7 days

  Manually select the time interval to generate the report for by selecting the **History Query(Listen Past 7Days)** radio button. In the **From** and **TO** date/time textboxes that appear, specify the starting and ending time of the desired time interval to view the history report generated based on statistics collected during this period. Note that the maximum time interval you can enter is 7 days.

Step 5 Click **[Go]** to refresh the report to display the graph according to your settings.

10.3.4 IP Traffic Statistics Reports

This report lists all IP addresses of hosts whose upload and/or download bandwidth are restricted by SifoWorks' IP rate limit function. You can view each IP address and their current upload, download and total bandwidth utilization in this report.

From the **Operation** column, click the icon to view the IP rate limit rule defined for the corresponding IP address. You can directly edit the IP rate limit rule from this interface.

CONFIGURATION PROCEDURE

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Note:

If you are intending to edit the IP rate limit rule for one or more IP addresses, please login using a read/write administrator account. If you are viewing the report only and not modifying any configurations, simply login with a read-only account.

Step 2 From the left menu bar, select **"Reporter > IP Traffic Statistics"**.

Step 3 The list of IP addresses whose bandwidth is limited will be displayed. From this list, you can:

- View all IP addresses with bandwidth limitations and their current upload, download and total bandwidth utilization.
- Edit the IP rate limit for a particular IP address. Click the icon from the **Operation** column corresponding to the IP address you wish to modify the IP rate limit for. Please refer to "7.3 Limiting IP Traffic" for details on this interface.

10.3.5 Session Number

These are reports showing the number of established sessions, new sessions and total sessions. Established sessions refer to all sessions that have been accepted by SifoWorks. New sessions refer to connections waiting for SifoWorks' reply. Total sessions include the number of both established and new sessions.

You can also select to view reports showing the distribution of sessions according to the various protocols including TCP, UDP, and ICMP etc.

SifoWorks generates session number reports using statistics collected from the past 1 hour. You can also view history session number reports that were generated using statistics from any previous 7 days interval.

CONFIGURATION PROCEDURE

The procedure below explains how to view the traffic reports generated by SifoWorks. It also describes the various options available when viewing these reports.

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu bar, select **"Reporter > Session Number"**.

Step 3 The session number report will be displayed. Here, you can select whether to view current reports (statistics from the past 1 hour) or history reports (statistics from any past interval of up to 7 days).

- View report generated using statistics for the last 1 hour

  Click the **Current Monitor (Listen Current 1Hours)** radio button to view the chart generated based on statistics collected from the past 1 hour.

- View report generated using statistics from any past interval up to 7 days.

  Manually select the time interval to generate the report for by selecting the **History Query(Listen Past 7Days)** radio button. In the **From** and **TO** date/time textboxes that appear, specify the starting and ending time of the desired time interval to view the history report generated based on statistics collected during this period. Note that the maximum time interval you can enter is 7 days.

Step 4 Select to view the graph for **Established Session**, **New Session** or **Total Session**.

Step 5 Click **[Go]** to refresh the report to display the graph according to your settings.

Step 6 (Optional) Click the "*Distribution*" tab to view a pie chart showing the distribution of sessions according to the various types of protocols. From this interface, you can:

- View the distribution for established sessions

  Select the **Established sessions** radio button to view the pie chart showing the distribution of established sessions according to the various protocols.

- View the distribution for new sessions

  Select the **New sessions** radio button to view the pie chart showing the distribution of new sessions according to the various protocols.

10.3.6 Session Rate

These reports show the rate at which sessions are established or new sessions are created. You can select to view session reports for specific protocols, such as TCP, UDP, and ICMP etc., only. SifoWorks generates session rate reports using statistics collected from the past 1 hour. You can also view history session rate reports that were generated using statistics from any previous 7 days interval.

CONFIGURATION PROCEDURE

Each step below explains how to view each type of reports via the SifoWorks UI.

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu bar, select **"Reporter > Session Rate"**.

Step 3 In this interface, select whether to display the chart showing the rate at which established sessions are created or the rate at which new sessions are created (**Options**).

Step 4 Select the **Protocol** of the sessions that you want to view the graph for.

Step 5 Select whether to view the graph for the last 1 hour or for any previous time interval up to 7 days.

- To view report generated using statistics for the last 1 hour:

  Click the **Current Monitor (Listen Current 1Hours)** radio button to view the chart generated based on statistics collected from the past 1 hour.

- To view report generated using statistics from any past interval up to 7 days

  Manually select the time interval to generate the report for by selecting the **History Query(Listen Past 7Days)** radio button. In the **From** and **TO** date/time textboxes that appear, specify the starting and ending time of the desired time interval to view the history report generated based on statistics collected during this period. Note that the maximum time interval you can enter is 7 days.

Step 6 Click **[Go]** to refresh the report to display the graph according to your settings.

10.4 Performing Network Diagnostics

SifoWorks provides two network diagnostics command, Ping and Traceroute, to help you test for connectivity between SifoWorks and the networks.

CONFIGURATION PROCEDURE - PING

The procedure to execute the Ping command from the SifoWorks Web UI is as follows:

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu, select **"Diagnostics > Ping"**.

Step 3 In the "Ping Test" interface that appears, enter the **Domain Name** or **IP Address** of the ping target.

Step 4 (Optional) Set up the various optional parameters of the Ping command including the **Number of Pings** packets to send, the **Size** of each ping packet, and the time **Interval** between the sending of each packet.

Step 5 Click **[Confirm]** to execute the command. The interface will automatically refresh to display the result of the Ping command.

📖 Note:

You can manually navigate to the result screen by selecting **"Diagnostics > Ping Result"** from the left menu bar.

Step 6 From the Ping result screen, you can:

- Click **[Cancel]** to terminate the current Ping command execution.
- Click **[Clear]** to clear the current result screen.

CONFIGURATION PROCEDURE – TRACE ROUTE

The procedure to execute the Traceroute command from the SifoWorks Web UI is as follows:

Step 1 Login to SifoWorks via a read/write or read-only administrator account.

Step 2 From the left menu, select **"Diagnostics > Trace Route"**.

Step 3 In the "Trace Route" interface that appears, enter the **Domain Name** or **IP Address** of the traceroute target.

Step 4 (Optional) Set up the various optional parameters of the command including the **Number of Hops**, **Number of Probes**, and the amount of time to wait for a respond after sending a traceroute packet before it **Timeout**.

Step 5 Click **[Confirm]** to execute the command. The interface will automatically refresh to display the result of the traceroute command.

📖 Note:

You can manually navigate to the result screen by selecting **"Diagnostics > Trace Route Result"** from the left menu bar.

Step 6 From the traceroute "Result" screen, you can:

- Click **[Cancel]** to terminate the current traceroute command execution.
- Click **[Clear]** to clear the current result screen.

10.5 Restoring System Settings

This section includes restoring SifoWorks' configurations to factory default settings, retrieving the system's administrative IP address, and resetting the default administrator account password, helping you restore your system in the event of system failures.

⚠ Warning:

Restoring the system's configurations may disconnect all system operations from the network. You may be required to reconfigure your system to re-connect it to the network. Therefore, we recommend that you backup the current system's configurations before the restore operation.

CONFIGURATION PROCEDURE – RESTORING THE SYSTEM VIA THE WEB UI

This set of steps guide you through the method to restore your system to the default factory settings via the system's web interface.

Step 1 Login to SifoWorks via the "admin" account.

🕮 Note:

If you do not remember the password for the default administrator "admin" account, you can recover the password by pressing and holding the "Reset" button (located between MGT0 and the power LED on the device's front panel) for at least 10 seconds using a thin wire. You can only execute the password recovery operation if you have enabled this function (**Enabled Password Recover** option) from the **"System > Common Setting"** interface.

If you have forgotten the device's administrative IP address, please refer to "Configuration Procedure – Retrieving Administrative IP Via Serial Port" for information on retrieving this IP.

Step 2 From the left menu bar, select **"System > Common Settings"**.

Step 3 Click the "*Advanced Options*" tab on the displayed interface.

Step 4 Here, click the **[Restore to Default]** button to restore your system's configurations.

CONFIGURATION PROCEDURE – RETRIEVING ADMINISTRATIVE IP VIA SERIAL PORT

The following steps help you to retrieve your system's administrative IP address by connecting a PC directly to the device's management serial port.

Step 1 Using a RS-232 serial cable, connect SifoWorks' management serial port to your administrative PC's COM port.

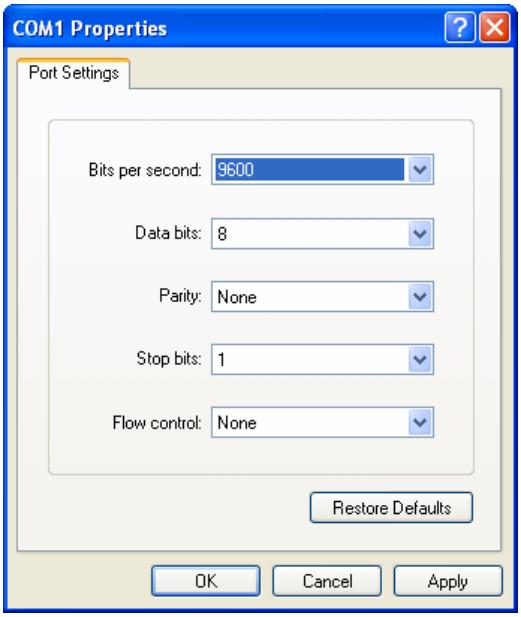
Step 2 On the administrative PC, activate a hyper terminal program and establish a connection to SifoWorks with the following configurations:

Bits per second: 9600

Data bits: 8

Parity: None

Stop bits: 1



Step 3 Enter the user name and password to login to SifoWorks via the hyper terminal.

The login user name and password is "admin" and "admin123" respectively.

Step 4 Enter the command "get ip ADMIN" into the interface. The system will display your system's administrative IP address.

📖 Note:

Type the command "?" to view the command line interface's help information.

Chapter

11

Device Deployment Example

This chapter includes the following sections:

- Network Topology and Company Requirements

  This section explains the network topology of a typical company used in this example and analyzes the various network requirements including NAT, filter rules, VPN and IDS etc.

- Configuration Flowchart

  A flowchart showing the configuration procedure that will be detailed in later sections is displayed here.

- Phase 1 – Configuring the Basic Network Settings

  Explains phase 1 of the configuration procedure, guiding you through the steps to set up SifoWorks' basic network settings.

- Phase 2 – Configuring NAT

  Explains phase 2 of the configuration procedure, guiding you through the steps to define NAT rules according to the requirements.

- Phase 3 – Defining Filter Rules

  Explains phase 3 of the configuration procedure, guiding you through the steps to manage the filter rules on the device.

- Phase 4 – Configuring VPN

  Explains phase 4 of the configuration procedure, guiding you through the steps to set up the device such that remote users are able to establish VPN connections with the internal network.

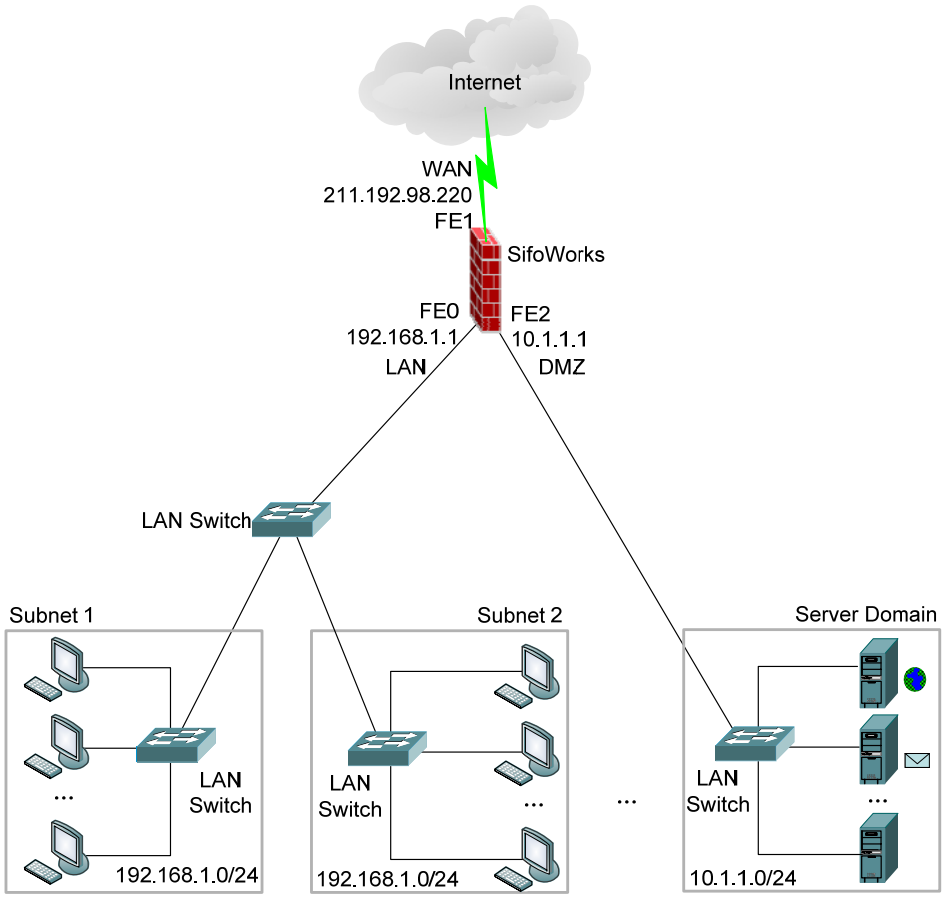
- Phase 5 – Setting up IDS

  Explains phase 5 of the configuration procedure, guiding you through the steps to set up SifoWorks' IDS function.

Please refer to this chapter when you want to completely deploy and configure your SifoWorks device to operate correctly in your network.

11.1 Network Topology and Company Requirements

This chapter guides you through the procedure to configure SifoWorks such that the device operates correctly and provides the necessary functions to meet the needs of the network shown in the topology below.



SifoWorks is deployed in the network using route mode.

An analysis of the network requirements and the corresponding configurations that should be made on SifoWorks is shown in the table below.

Network Settings	
Virtual Port	• Virtual Port 1: FE0 • Virtual Port 2: FE1 • Virtual Port 3: All other ports
VLAN	• LAN: FE0 • WAN: FE1 • DMZ: FE2
IP Address	• LAN: 192.168.1.1/255.255.255.0 • WAN: 211.192.98.220/255.255.255.0 • DMZ: 10.1.1.1/255.255.255.0
Route	Static route for the WAN outgoing interface with the following configurations: • Destination IP/Netmask: 0.0.0.0/0.0.0.0 • Gateway: 211.192.98.217

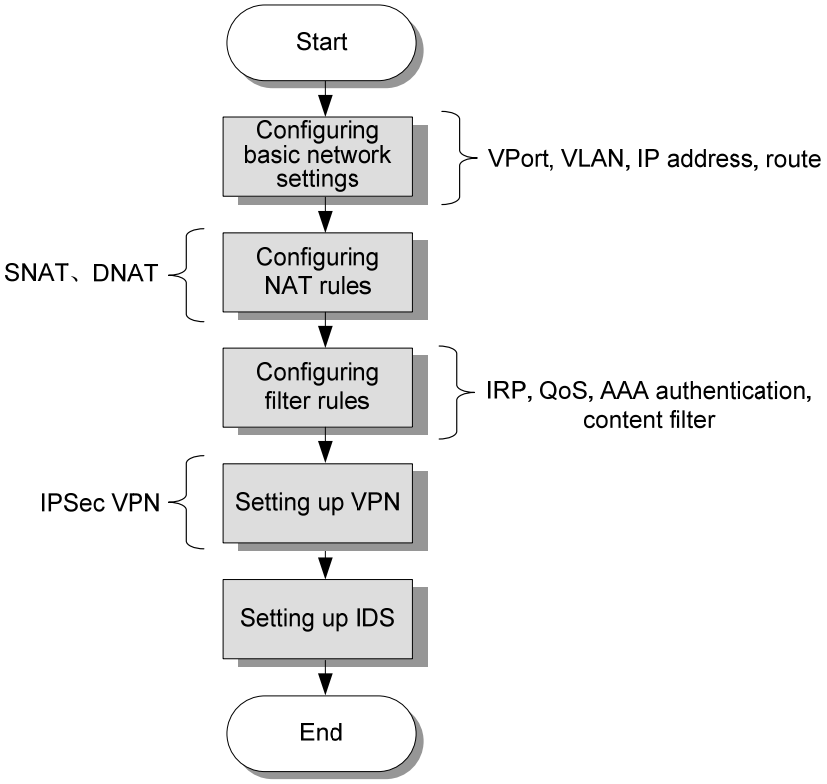
NAT	
SNAT	From LAN to WAN. Translated source IP: 211.192.98.220 Port range: 1025 – 65535
DNAT	From WAN to DMZ. Translated destination IP: 10.1.1.2 Translated port: 80

Filter Rules	
IRP, QoS	The firewall should provide the following data filtering control: • External users in the WAN network can access the Web server in the DMZ domain via HTTP QoS is applied on all WAN to DMZ traffic (VPort2 to VPort3) Maximum bandwidth: 60Mbps Guaranteed bandwidth: 20Mbps • LAN users can access the Web server in the DMZ domain via HTTP • LAN users can access the SMTP server in the DMZ domain via SMTP SifoWorks' Intelligent Recognized Protocols (IRP) must be enabled for each of the above filter rules, preventing illegal data flows. Log must be enabled for the above filter rules for future analysis.
AAA Authentication, Content Filtering	LAN users in the domain 192.168.1.10/255.255.255.0 must be authenticated by SifoWorks' AAA module before they can access the WAN network via HTTP. All users are authenticated locally. The list of users are: • User01/123456 • User02/123456 • …… These users are not allowed to access the following URLs: • www.sina.com • www.sohu.com • www.163.com • www.china.com • www.chinaren.com • www.google.cn

VPN	
IPsec VPN	To allow remote mobile employees to access the internal servers in the DMZ domain securely, SifoWorks must be able to accept VPN connection requests from these remote users. VPN connections uses the pre-shared key “12345678”. IKE phase 1 algorithm is “3des-md5-modp1536”. IKE phase 2 algorithm is “esp-3des-md5”.
IDS	Enable SifoWorks’ IDS function to protect the internal network against attacks. When traffic exceeds a threshold, SifoWorks must automatically drop connections. Threshold values for both source based and destination based traffic are to maintained as the system’s default value with packet rate limit enabled. SYN proxy is disabled on the system. SifoWorks must also be able to detect and prevent LAND Attack and ARP spoof attacks.

11.2 Configuration Flowchart

This example follows the following procedure when setting up SifoWorks to suit the requirements explained in the previous section.



11.3 Phase 1 – Configuring the Basic Network Settings

11.3.1 Configuration Procedure

This section provides a step by step guide to setting up SifoWorks' basic network settings.

⚠ Warning:

The steps shown below assume that your SifoWorks device has been powered on but not yet connected to the network.

If SifoWorks has already been connected to the network, you may still carry out these steps as normal but certain traffic may be disconnected before completing "11.5 Phase 3 – Defining Filter Rules" below.

Step 1 Connect SifoWorks' administrative interface to your PC via a network cable.

Step 2 Login to the system using the "admin" administrator account.

🕮 Note:

Please refer to "2.2.1 System Login" for an explanation on how to login to the system's UI.

Step 3 Configure the virtual ports

1. From the left menu bar of the interface, select **"Network > Virtual Port Config"**.
2. At the bottom of the list of ports, click **[Virtual Port Config]**.
3. Using the ---> and <--- buttons, move "FE0" to "Virtual Port 1", "FE1" to "Virtual Port 2" and all other ports to "Virtual Port 3".
4. Click **[Save]** to save the settings and return to the port list.

Step 4 Configure VLANs

1. Select **"Network > VLAN Setting"** from the left menu bar.
2. Click the icon corresponding to the system default "VLAN1". In the "VLAN Configure" interface that appears, unselect all data ports from this VLAN.
3. Click **[Save]** to save the modification and return to the VLAN list.
4. Click **[Add New VLAN]** from the bottom of the list.
5. The "Add New VLAN" configuration interface will be displayed. Here, configure:

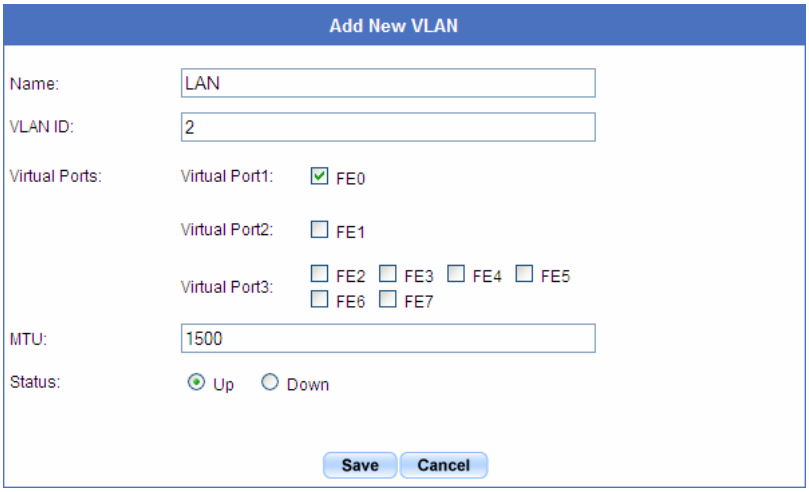
   Name: LAN

   VLAN ID: 2

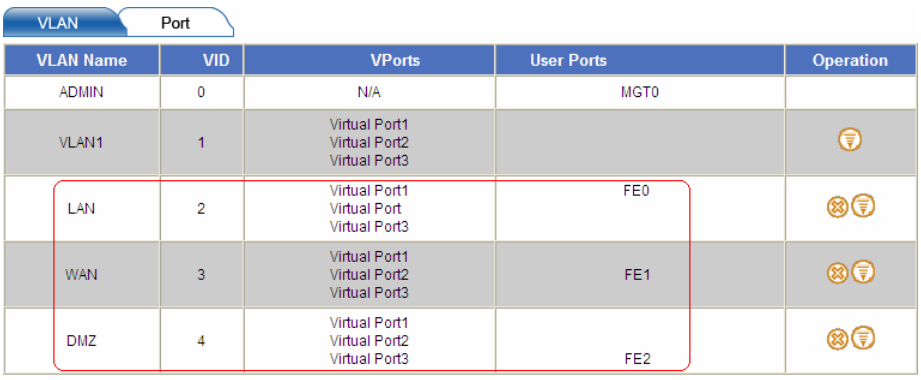
   Select the port "FE0".

   MTU: 1500

   Status: Up



6. Click **[Save]** to save the new VLAN.
7. Repeat (4) – (6) to add 2 other VLANs for the WAN and DMZ domains. The final VLAN list should be similar to the figure below.



VLAN Name	VID	VPorts	User Ports	Operation
ADMIN	0	N/A	MGT0	
VLAN1	1	Virtual Port1 Virtual Port2 Virtual Port3		
LAN	2	Virtual Port1 Virtual Port Virtual Port3	FE0	
WAN	3	Virtual Port1 Virtual Port2 Virtual Port3	FE1	
DMZ	4	Virtual Port1 Virtual Port2 Virtual Port3	FE2	

Step 5 Configure IP addresses

1. From the left menu bar, select **"Network > IP Config"**. The list of VLANs and their corresponding IP addresses will be displayed.
2. Click the icon corresponding to the VLAN "LAN" in the list to display the "Show IP Configure" interface.
3. Select "Static IP Address" and click **[Add New IP]**.
4. In the next interface, enter the **IP Address** "192.168.1.1" and **Netmask** "255.255.255.0".
5. Click **[Save]** to save this IP address and return to the "Show IP Configure" interface.
6. Click **[Return]** to return to the list of VLANs.
7. Repeat steps (2) – (6) to configure the IP address for the WAN and DMZ domains as follows:
   - WAN: 211.192.98.220/255.255.255.0
   - DMZ: 10.1.1.1/255.255.255.0

   The resultant list of VLAN IP addresses should be identical to the figure below.

Index	VLAN Name	VLAN ID	IP Address	Netmask	Operation
0	ADMIN	0	172.16.0.1	255.255.0.0	
1	VLAN1	1			
2	LAN	2	192.168.1.1	255.255.255.0	
3	WAN	3	211.192.98.220	255.255.255.0	
4	DMZ	4	10.1.1.1	255.255.255.0	

Step 6 Add static routes

1. From the left menu bar, select **"Network > Route Setting"**.
2. At the bottom of the static route list that displays, click **[Clear Invalid Routes]** to remove all invalid static routes from the system.
3. Click **[Add New Static Route]**.
4. In the "Add New Static Route" interface that appears, configure:

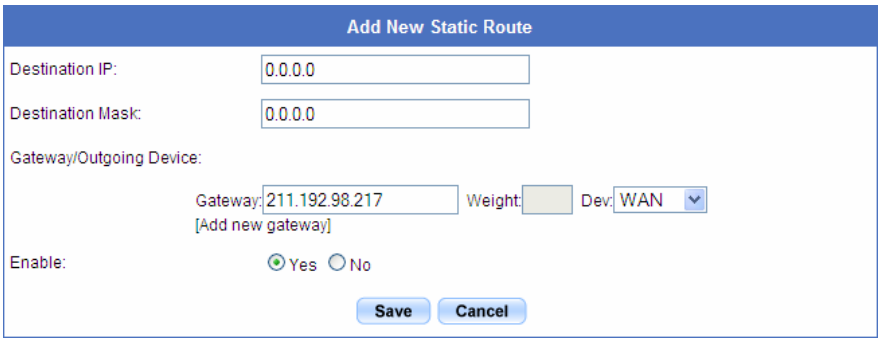
   Destination IP: 0.0.0.0

   Destination Mask: 0.0.0.0

   Gateway: 211.192.98.217

   Dev: WAN

   Enable: Yes



5. Click **[Save]** to save the new route

11.3.2 Testing the Configuration

If SifoWorks has already been connected to the network (that is, network cables have already been connected between FE0, FE1 and FE2 and the networks), and an Accept All filter rule has been added, hosts in the connected LAN, WAN and DMZ networks should be able to communicate with each other. You may use the Ping command to test this connectivity.

If your device has not been connected to the network, you will not be able to perform any tests to check the configurations made during this phase at this point. Please continue to the next configuration phase below.

11.4 Phase 2 – Configuring NAT

11.4.1 Configuration Procedure

The following steps guide you through setting up the NAT rules required according to the network analysis in "11.1 Network Topology and Company Requirements".

Step 1 From the left menu bar, select **"Firewall > NAT Rule"**. The list of source NAT (SNAT) rules will be displayed.

Step 2 Add SNAT rule

1. In the "*SNAT*" tab, click **[Add New SNAT]**.
2. In the "Add New SNAT" configuration interface that is displayed, configure as follows:

   Virtual Port From: VPort1

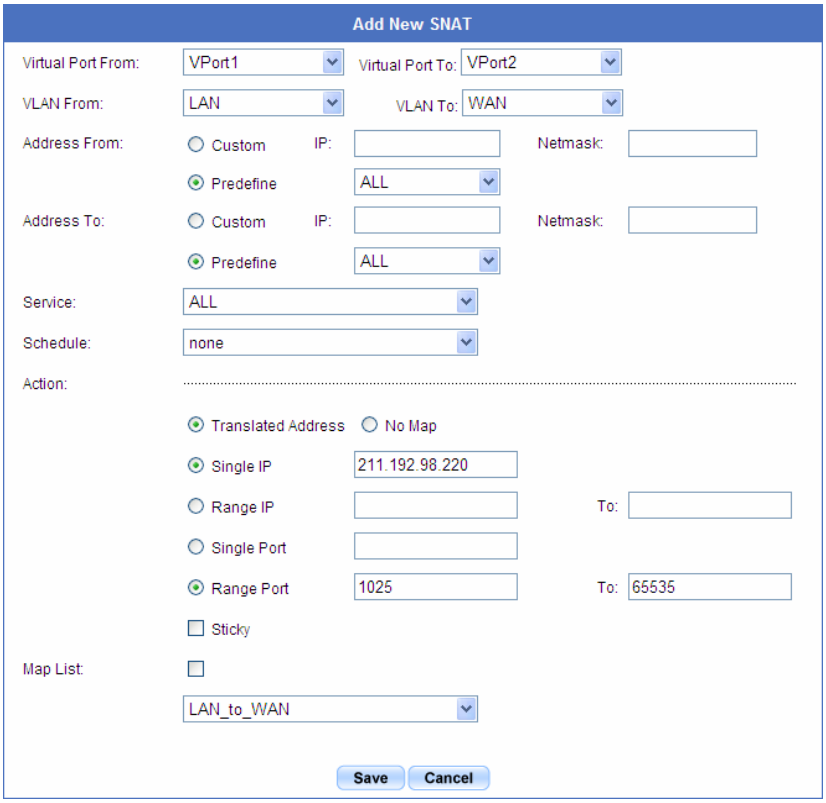
   Virtual Port To: VPort2

   VLAN From: LAN

   VLAN To: WAN

   Single IP: 211.192.98.220

   Range Port: 1025-65535



3. Click **[Save]** to save the SNAT rule.

Step 3 Add destination NAT (DNAT) rule

1. In the NAT list, click the "*DNAT*" tab to view the list of destination NAT rules.
2. At the bottom of this list, click **[Add New DNAT]**.

   Virtual Port From: VPort2

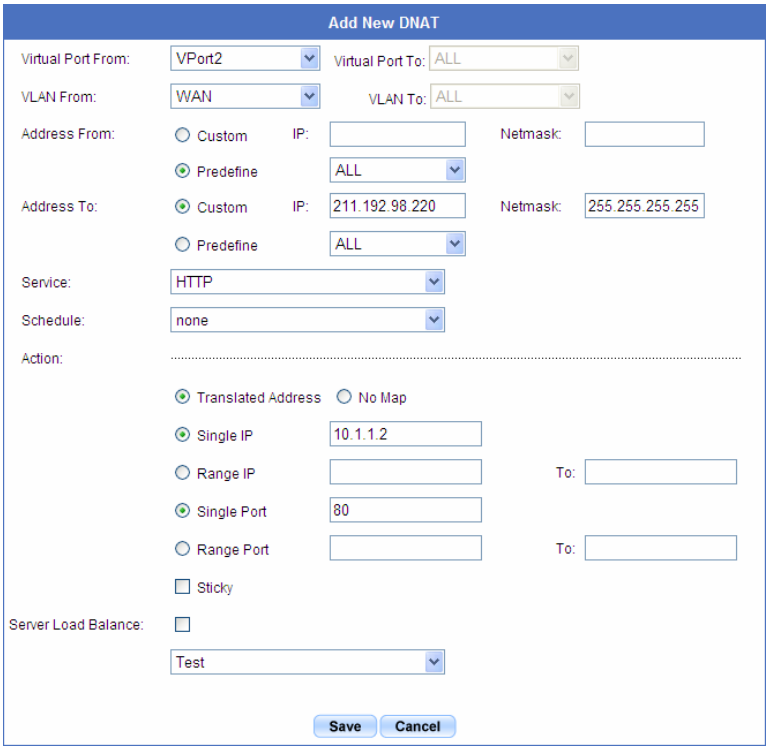
   VLAN From: WAN

   Address To: 211.192.98.220/255.255.255.255

   Service: HTTP

   Single IP: 10.1.1.2

   Single Port: 80



3. Click **[Save]** to save the DNAT rule.

11.4.2 Testing the Configuration

If SifoWorks is connected to the network (that is, network cables have already been connected between FE0, FE1 and FE2 and the networks), and an Accept All filter rule has been added, hosts in the LAN domain will be able to access the external network using masked addresses. External users will also be able to access the web server in the DMZ domain via the address "http://211.192.98.220/".

Otherwise, you will not be able to perform any tests to check the configurations made during this phase at this point. Please continue to the next configuration phase below.

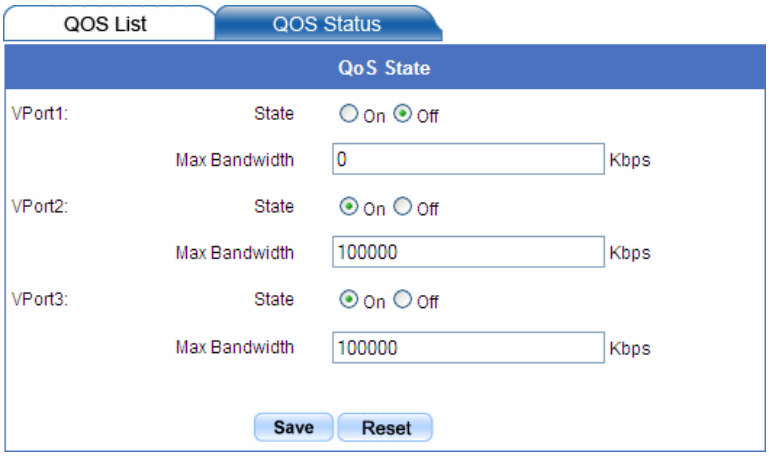
11.5 Phase 3 – Defining Filter Rules

11.5.1 Configuration Procedure

These steps guide you through defining and managing the filter rules necessary to control network traffic according to the network requirements determined in "11.1 Network Topology and Company Requirements".

Step 1 Activate QoS status and specify the maximum bandwidth for each virtual port

1. Select **"Advance > QoS Setting"** from the left menu bar.
2. In the interface that displays, click the "*QOS Status*" tab.
3. Click the radio buttons to "On" QoS for **VPort2** and **VPort3**. Enter the maximum bandwidth assigned to each of these virtual ports as "100000".



4. Click **[Save]** to save the QoS state setting.

Step 2 Define QoS priority levels for virtual ports

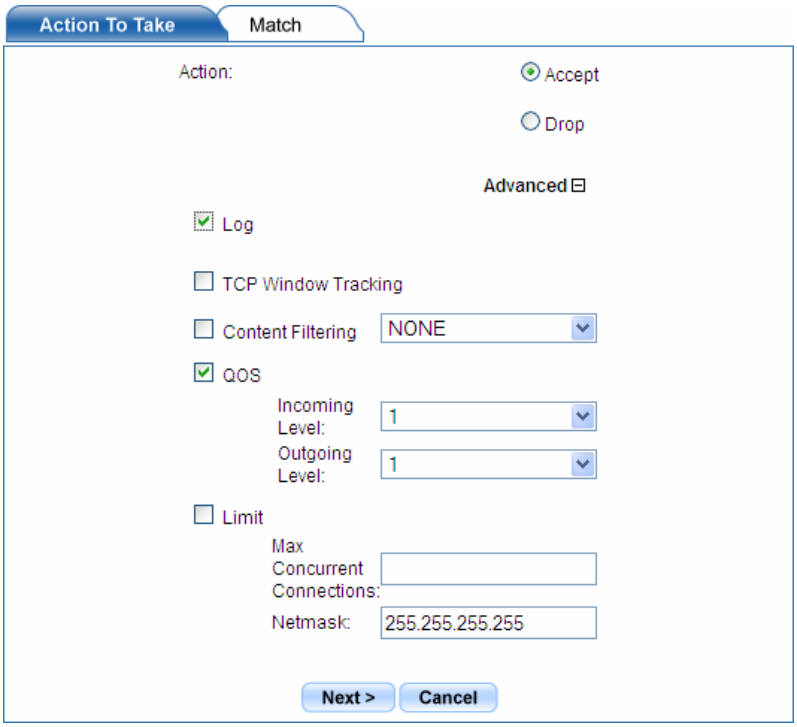
1. From the left menu, select **"Advance > QoS Setting"**. In the interface displayed, click to display the "*QOS List*" tab.
2. Click the "⊞" icon corresponding to VPort2 to expand the list to display virtual port 2's priority levels.
3. Click the icon for VPort2's priority level "1". In the interface that displays, enter "60000" and "20000" in the **Max. Bandwidth** and **Guaranteed Bandwidth** textboxes respectively.
4. Click **[Save]** to save the setting and return to the QoS list.
5. Repeat steps 2-4 to configure the QoS priority level for VPort3. The resulting QoS list should be similar to the figure below.

QOS List | QOS Status

Interface	Level	Max Bandwidth	Guaranteed Bandwidth	Operation
⊞VPort1:				
⊟VPort2:				
	0	0 Kbps	0 Kbps	
	1	60000 Kbps	20000 Kbps	
	2	0 Kbps	0 Kbps	
	3	0 Kbps	0 Kbps	
⊟VPort3:				
	0	0 Kbps	0 Kbps	
	1	60000 Kbps	20000 Kbps	
	2	0 Kbps	0 Kbps	
	3	0 Kbps	0 Kbps	

Step 3 Add a filter rule, with QoS, to allow external users to access the Web server.

1. From the left menu, select **"Firewall > Filter Rule"** to view the list of filter rules already defined in the system.
2. Click **[Add New Filter Rule]** to view the 2-tab interface for adding filter rules.
3. In the "*Action To Take*" tab, select the rule **Action** "Accept".
4. Click **Advanced⊞** to view the advanced rule options.
5. Check the checkbox to enable **Log** and **QOS**.
6. Select "1" for both the **Incoming Level** and **Outgoing Level** fields.



7. Click **[Next>]** to move to the "*Match*" tab and configure as follows:

   Virtual Port From: VPort2

   Virtual Port To: VPort3

   VLAN From: WAN

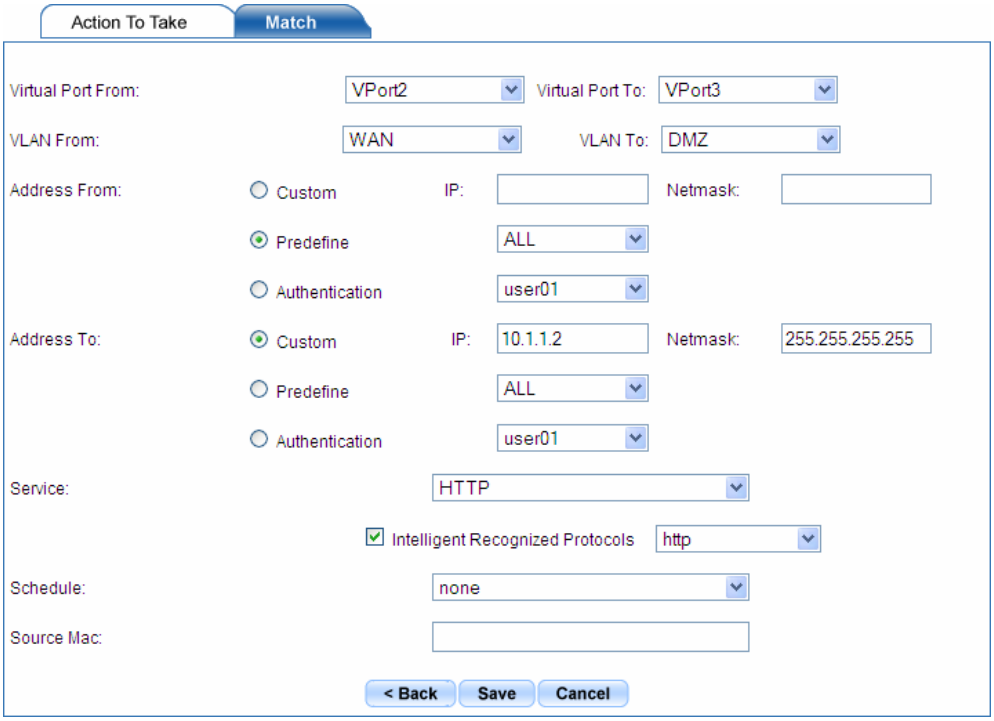
   VLAN To: DMZ

   Address From / Predefine: ALL

   Address To / Custom (IP/Netmask): 10.1.1.2/255.255.255.255

   Service: HTTP

8. Check the **Intelligent Recognized Protocols** checkbox and select "http" from the adjacent drop down menu.



9. Click **[Save]** to save the filter rule.

Step 4 Add a filter rule to allow LAN users access to the Web server.

1. Return to the filter rule list (**"Firewall > Filter Rule"**) and click **[Add New Filter Rule]**.
2. In the "*Action To Take*" tab, select the **Action** "Accept". Click **Advanced**⊞ to view the advanced rule options and enable **Log**.
3. Click **[Next>]** to view the "*Match*" tab.
4. Here, configure as follows:

   Virtual Port From: VPort1

   Virtual Port To: VPort3

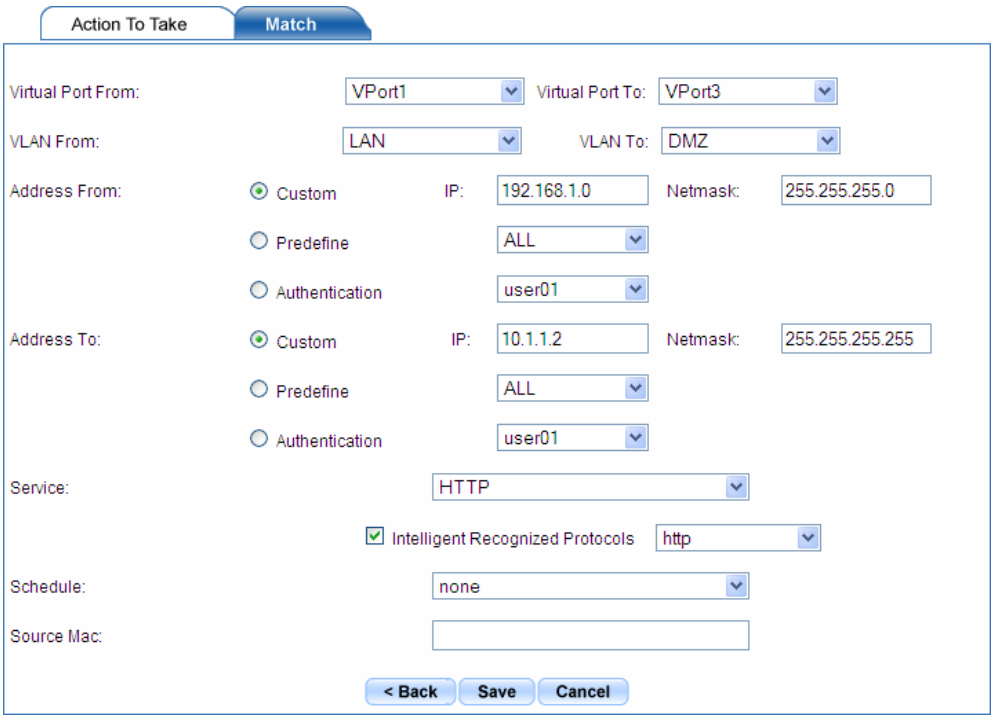
   VLAN From: LAN

   VLAN To: DMZ

   Address From/Custom(IP/Netmask): 192.168.1.0/255.255.255.0

   Address To / Custom (IP/Netmask): 10.1.1.2/255.255.255.255

   Service: HTTP
5. Check the **Intelligent Recognized Protocols** checkbox and select "http" from the adjacent drop down menu.



6. Click **[Save]** to save the filter rule.

Step 5 Add a filter rule to allow LAN users to access the mail server

1. Return to the filter rule list (**"Firewall > Filter Rule"**) and click **[Add New Filter Rule]**.
2. In the "*Action To Take*" tab, select the **Action** "Accept". Click **Advanced**⊞ to view the advanced rule options and enable **Log**.
3. Click **[Next>]** to view the "*Match*" tab and configure as follows:

   Virtual Port From: VPort1

   Virtual Port To: VPort3

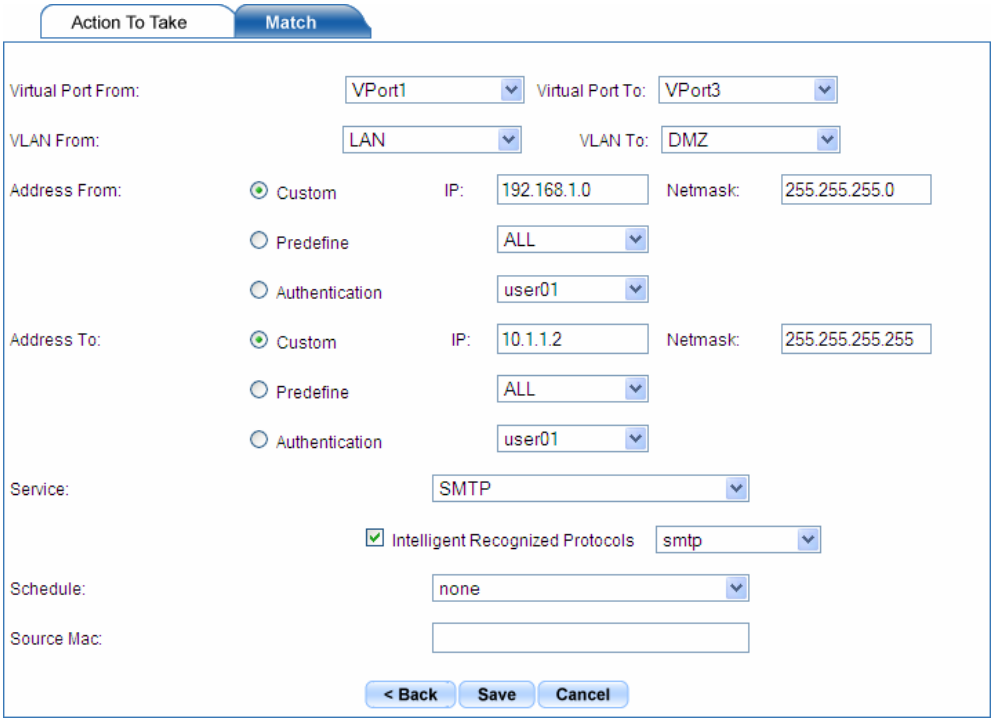
   VLAN From: LAN

   VLAN To: DMZ

   Address From/Custom(IP/Netmask): 192.168.1.0/255.255.255.0

   Address To / Custom (IP/Netmask): 10.1.1.2/255.255.255.255

   Service: SMTP
4. Check the **Intelligent Recognized Protocols** checkbox and select "smtp" from the adjacent drop down menu.



5. Click **[Save]** to save the filter rule.

Step 6 Add an address object

1. From the left menu bar, select **"Object > Address"**.
2. In the "*Address*" tab, click **[Add New Address]**.
3. The "Add New Address" interface will appear. Configure as follows:

   Address Name: ExampleAddress

   IP: 192.168.1.0

   NetMask: 255.255.255.0
4. Click **[Save]** to save the address object and return to the object list.

Step 7 Add authentication users

1. From the left menu bar, select **"System > Auth User"**.
2. From the bottom of the list displayed, click **[Add New Auth User]**.
3. In the next "Add New AuthUser" interface, configure as follows:

   User Name: User01

   AuthServer: LOCAL

   User Attribute: Filterrule

   Status: Enable

   Password: 123456

   Confirm Password: 123456
4. Click **[Save]** to save the new authentication user and return to the user list.
5. Repeat (2) – (4) to add the other authentication users.

Step 8 Add authentication user group

1. Select **"System > Auth Group"** from the left menu.
2. Click **[Add New Auth User Group]** to view the "Add New Authuser Group" interface.
3. Enter the **Auth Group Name** "ExampleGroup". Check the "Filterrule" **Attribute**.
4. Select all authentication users added in step 3 above from the "Available Users" list and click ---> to assign users to this group.
5. Click **[Save]** to save the authentication user group and return to the list.

Step 9 Add authentication addresses

1. From the left menu bar, select **"System > Auth Address"**.
2. From the bottom of the list displayed, click **[Add New Auth Address]**.
3. The "Add New Auth Address" interface will display. Configure as follows:

   Name: ExampleAuthAddress

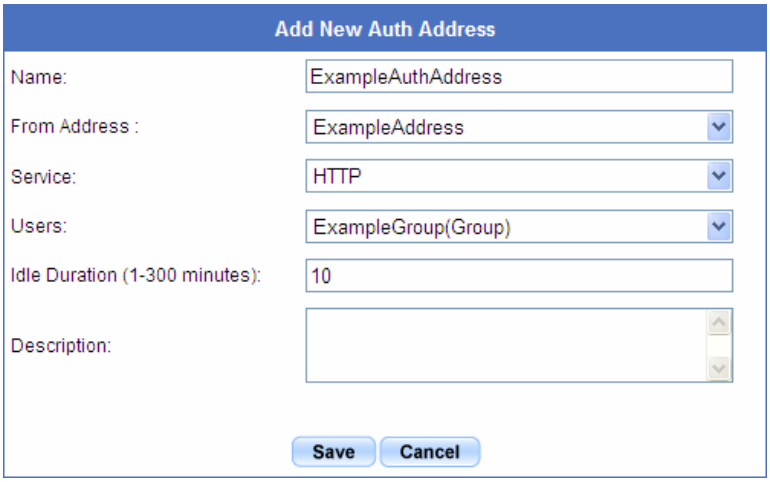
   From Address: ExampleAddress

   Service: HTTP

   Users: ExampleGroup

Note:

Idle Duration refers to the timeout value of users' access to the Internet via SifoWorks after authentication. If no Internet access via SifoWorks was made by the authenticated user for this period of time, the system will prompt the user to re-authenticate himself.



4. Click **[Save]** to save the new authentication address.

Step 10 Customize the user authentication interface

1. From the left menu bar, select **"System > Auth Server"**.
2. Click the "*Banners*" tab to customize the authentication interface.
3. Here, enter the various messages including:

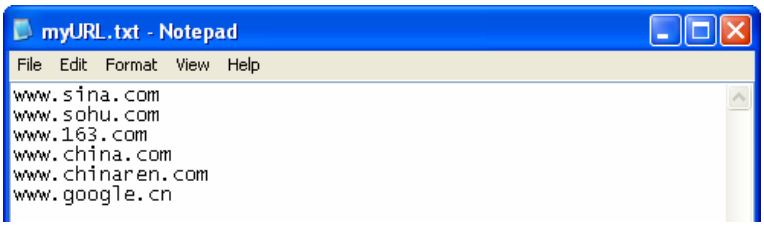
   Banner Title: Welcome ExampleGroup

   Success Message: Authentication Successful

   Failure Message: Authentication Failed. Please retry or contact the system administrator.
4. Click **[Save]** to save the settings.

Step 11 Add URL filtering object

1. Create a text file “myURL.txt” containing a list of all target URLs to be filtered. Each URL should be separated using a new line as shown below.

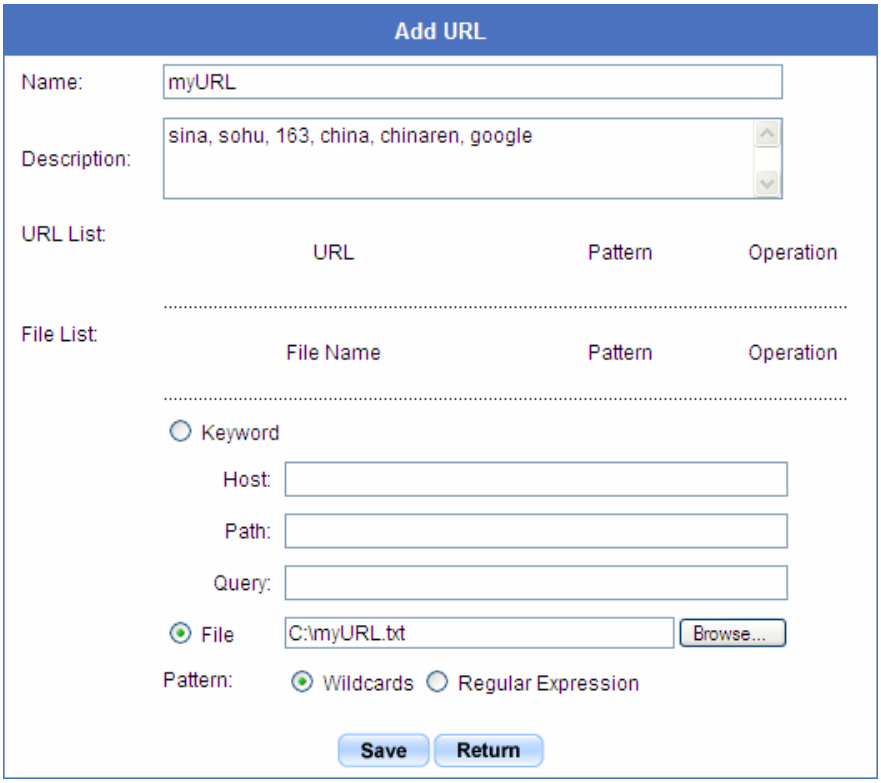


2. From the left menu bar of the SifoWorks web UI, select **“Object > Content Filtering Obj”**.
3. In the “*URL*” tab, click **[Add URL Obj]** from the bottom of the list displayed.
4. The “Add URL” interface will be displayed. Configure as follows:

   Name: myURL

   Description: sina, sohu, 163, china, chinaren, google

5. Select **File**. Click **[Browse...]** and select the text file containing the list of URLs created earlier (“myURL.txt”).



6. Click **[Save]**. The interface will refresh to display a new entry in the **File List**.
7. Click **[Return]** to save this URL object and return to the URL content filtering object list.

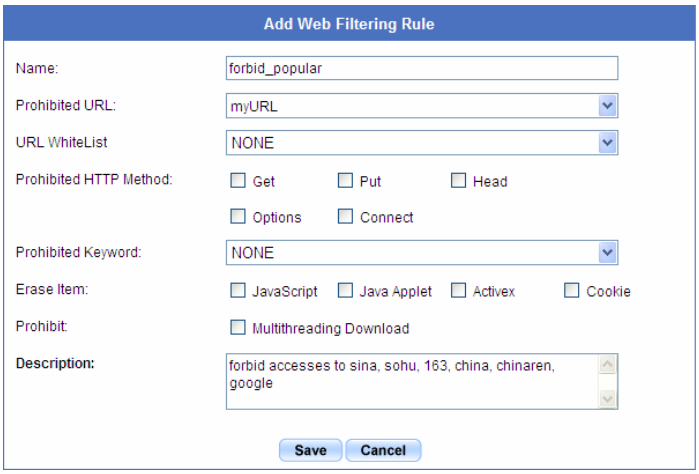
Step 12 Add a web content filtering rule

1. From the left menu bar, select **"Firewall > Content Filtering"**. The "*Web Filter*" tab interface will be displayed.
2. Click **[Add Web Filtering]** from the bottom of the web filtering rule list.
3. In the displayed interface, configure:

   Name: forbid_popular

   Prohibited URL: myURL

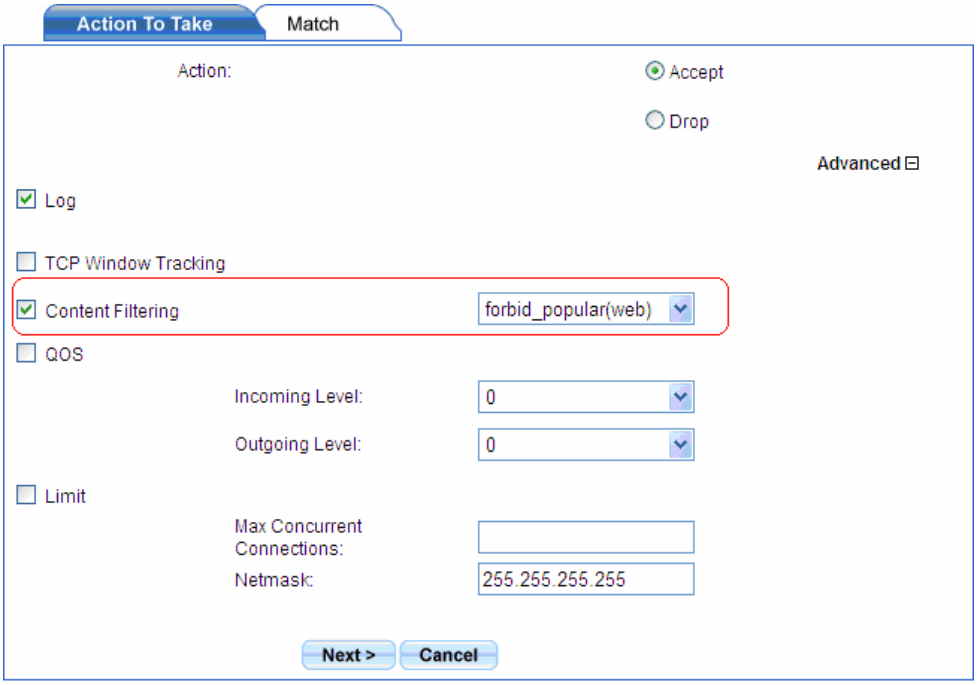
   Description: forbid accesses to sina, sohu, 163, china, chinaren, google



4. Click **[Save]** to save the new rule and return to the web filtering rule list.

Step 13 Add a filter rule, allowing LAN users to access external networks only after they are authenticated locally by the system. The filter rule must also prohibit user access to specific URLs.

1. From the left menu bar, select **"Firewall > Filter Rule"**.
2. Click **[Add New Filter Rule]** from the bottom of the filter rule list displayed.
3. In the "*Action To Take*" tab, select the rule **Action** "Accept" and click **Advanced**⊞ to view the advanced rule options.
4. Enable **Log** and **Content Filtering**. Select the content filtering rule "forbid_popular" from the adjacent drop down menu.



5. Click **[Next>]** to navigate to the "*Match*" tab and configure as follows:

   Virtual Port From: VPort1

   Virtual Port To: VPort2

   VLAN From: LAN

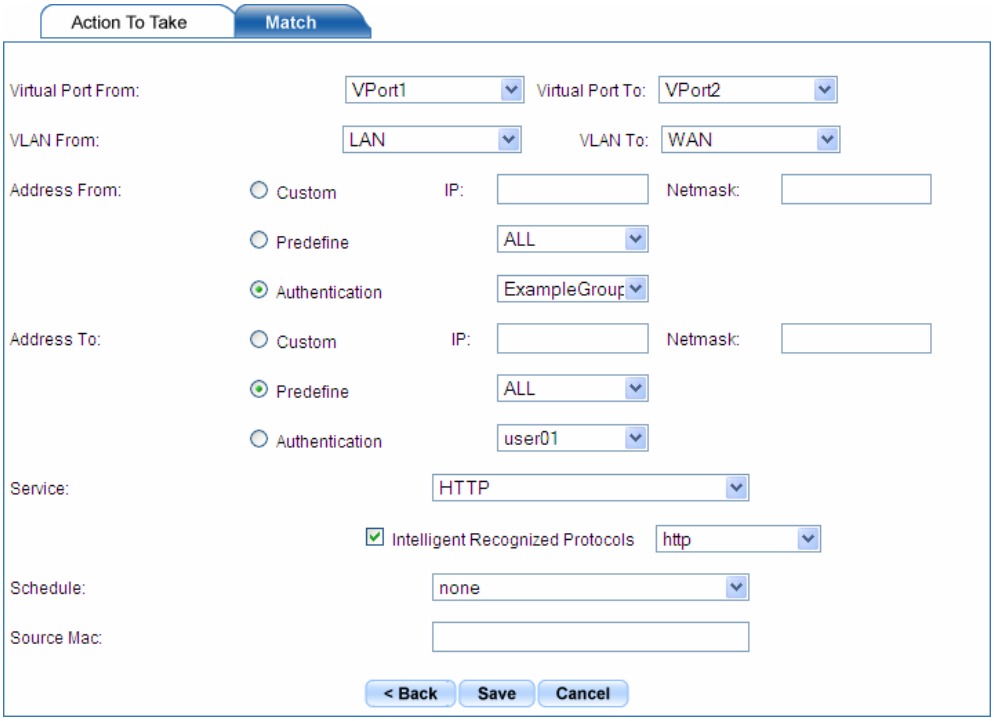
   VLAN To: WAN

   Address From / Authentication: ExampleGroup

   Address To / Predefine: ALL

   Service: HTTP

6. Check the **Intelligent Recognized Protocols** checkbox and select "http" from the adjacent drop down menu.



7. Click **[Save]** to save the filter rule.

11.5.2 Testing the Configuration

The steps below guide you through a test to ensure that SifoWorks' has been properly set up according to the configurations above and operate correctly in the network.

⚠ Warning:

During the testing process, if any network services are disconnected due errors in filter rule operations, you can add an Accept All filter rule to identify the error.

If you are unable to resolve the problem, please restore your network to the state before SifoWorks was deployed and contact O2Security's technical support personnel.

Step 1 Connecting SifoWorks to the networks

🕮 Note:

This step explains how to connect SifoWorks' data ports to the network. Please skip this step if your device is already connected to the network according to the example topology.

Using network cables, connect the LAN domain to the device's FE0 port, WAN domain to the FE1 port and the DMZ domain to the FE2 port.

Step 2 Check WAN to DMZ accesses

Attempt to access the Web server in the DMZ domain using a host in the WAN domain using the address "http://211.192.98.220".

If you can successfully access the server, please move to the next step.

If you are unable to access the server, the WAN to DMZ filter rule or DMZ's DNAT rule may be incorrect. Please check these rules and make any modifications required.

Step 3 Check LAN to DMZ accesses.

Attempt to access the Web server in the DMZ domain using a host in the LAN domain using the address "http://211.192.98.220".

If you can successfully access the server, please move to the next step.

If you are unable to access the server, the LAN to DMZ filter rule may be incorrect. Please check the rule and make any modifications required.

Step 4 Check LAN to WAN accesses

1. Using a host in the LAN domain (192.168.1.0/255.255.255.0), access the login interface “http://192.168.1.1/”.

   The authentication interface for authentication users uses the same IP address as that of SifoWorks management UI. However, the HTTP protocol is used instead. For example, if SifoWorks management UI address is “https://192.168.1.1/”, the address of the authentication interface will be “http://192.168.1.1/”.

📖 Note:

For hosts in subnets that requires authentication before HTTP accesses is allowed, entering any Internet address into the web browser will automatically direct the user to the system’s authentication interface. Upon successful authentication, the user will then be automatically directed to the entered web address.

2. In the authentication interface, enter the **UserName** “User01” and **Password** “123456”.

3. Click **[Auth]**. SifoWorks will attempt to authenticate the user. A success message will be displayed if the authentication is successful.
4. Attempt to access the URLs that are prohibited (as set up in the web content filtering rule) to check if the filter rule is effective.

   The device is operating in the network correctly if all 3 conditions below are true:

   - you can successfully login
   - access the Internet
   - is blocked from the web sites that were prohibited (such as www.sina.com)

   Otherwise, the LAN to WAN filter rule may not have been defined correctly. Please check the rule and make any modifications required.

11.6 Phase 4 – Configuring VPN

11.6.1 Configuration Procedure

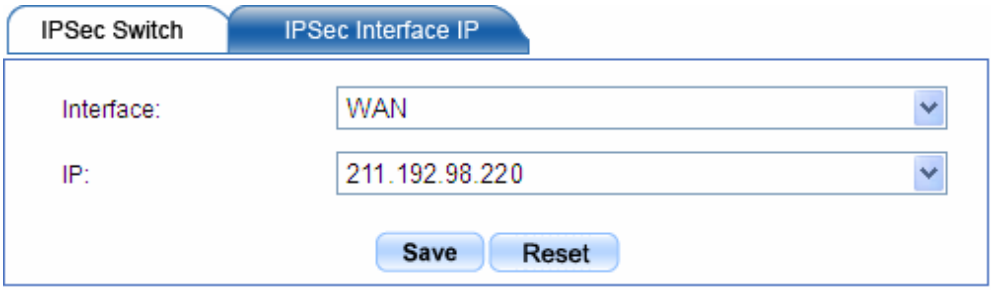
In this phase, set up SifoWorks to allow remote users to establish VPN connections with the device so that they can access internal resources from external networks securely.

Step 1 Enable VPN

1. From the left menu bar, select **"VPN > IPSec Setting"**.
2. Toggle the **VPN** module "ON".
3. Click **[Save]** to confirm the setting.

Step 2 Select the outgoing interface

1. From the **"VPN > IPSec Setting"** interface, click the "*IPSec Interface IP*" tab.
2. Select the VLAN "WAN" as the outgoing **interface**.



3. Click **[Save]** to save the configuration.

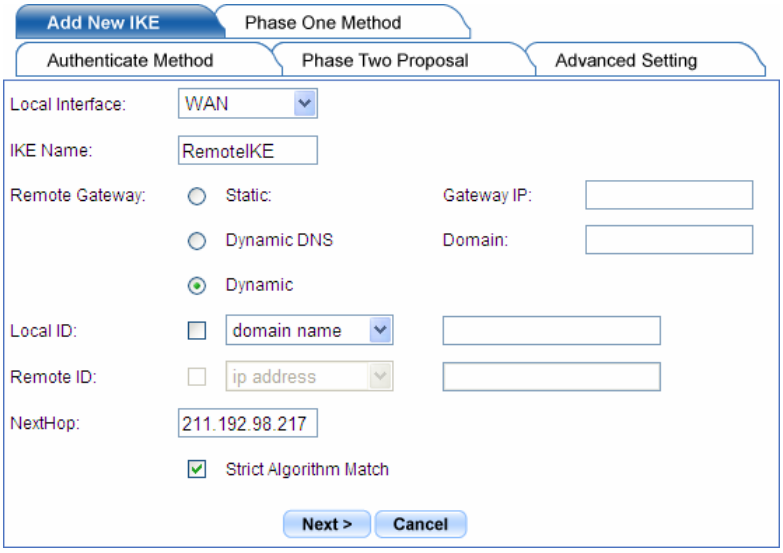
Step 3 Add IKE

1. From the left menu bar, select **"VPN > IKE"**.
2. From the bottom of the IKE list displayed, click **[Add New IKE]**.
3. The "*Add New IKE*" interface will be displayed. Configure as follows:

   IKE Name: RemoteIKE

   Remote Gateway: Dynamic

   NextHop: 211.192.98.217

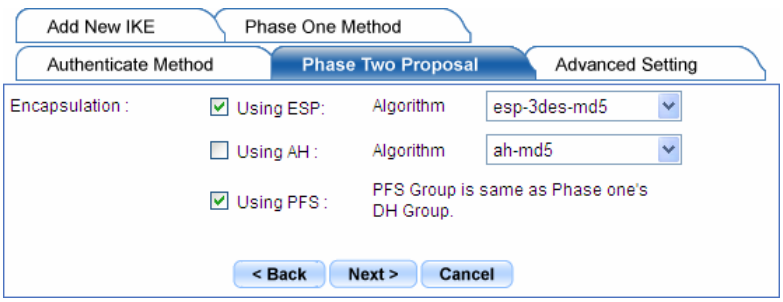


4. Click **[Next>]** to display the "*Phase One Method*" tab. Configure as follows:

   Algorithm: 3des-md5-modp1536

   Exchange: main mode

5. Click **[Next>]** to view the "*Authenticate Method*" tab. Select **PSK** and enter "12345678" as the **Preshare Key**. Re-enter this key in the **Retype** textbox to confirm.
6. Click **[Next>]** to display the "*Phase Two Proposal*" tab. Enable **Using ESP** and select the "esp-3des-md5" ESP **Algorithm**. Also select the **Using PFS** option.



7. Click **[Next>]** to view the "*Advanced Setting*" tab. Keep the default configuration for all parameters in this tab and click **[Save]** to save this IKE record.

Step 4 Add address objects

1. From the left menu bar, select **"Object > Address"** to display the list of address objects.
2. Click **[Add New Address]** and configure as follows:

   Name: Local

   IP: 10.1.1.0

   Netmask: 255.255.255.0
3. Click **[Save]** to add the new address object.

Step 5 Add VPN connection

1. From the left menu bar, select **"VPN > VPN Connection"** to view the list of VPN connections.
2. Click **[Add New VPN]**.
3. In the "Add New VPN Connection" interface, configure as follows:

   Connection Name: RemoteConnect

   Local Subnet: Local

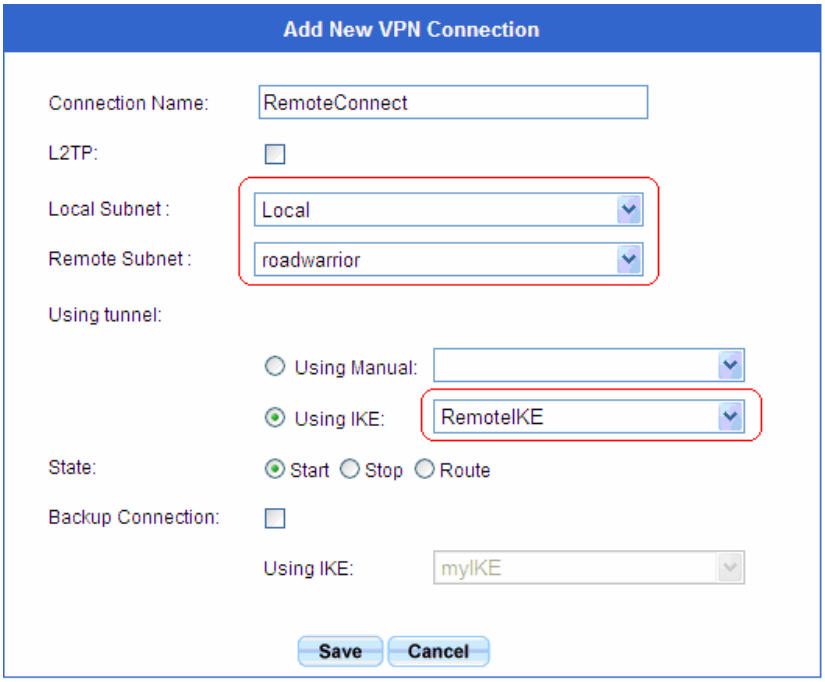
   Remote Subnet: roadwarrior

   Using Tunnel/Using IKE: RemoteIKE

   State: Start

📖 Note:

If the remote subnet of this VPN connection is dynamic (such as mobile client-end), select the address object "roadwarrior" for the **Remote Subnet** field. In this situation, VPN connections can only be initiated from the remote clients.



4. Click **[Save]** to add this VPN connection to the list.

11.6.2 Testing the Configuration

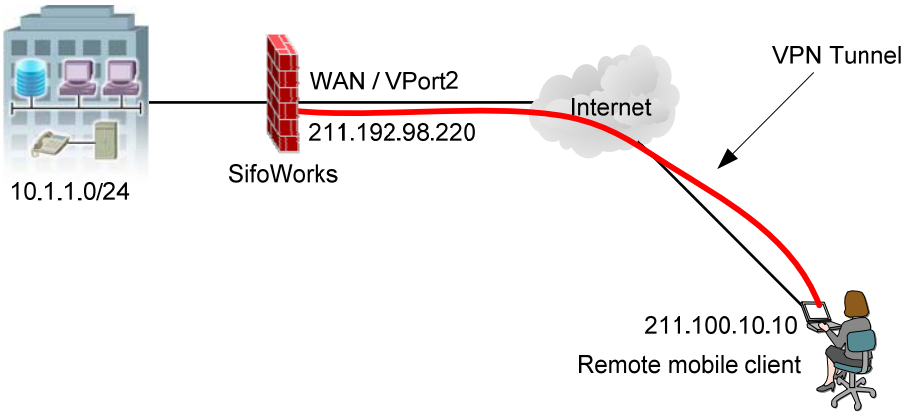
This procedure tests the system to check if SifoWorks' VPN function has been correctly configured.

Step 1 From a host in the WAN network, install an IPsec VPN client software. The software used in this example is SafeNet SoftRemote.

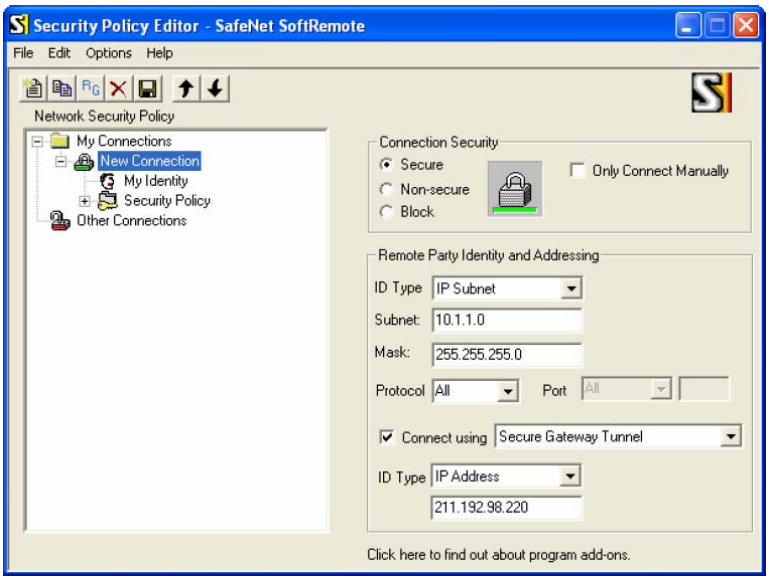
Step 2 Configure the IPsec VPN connection

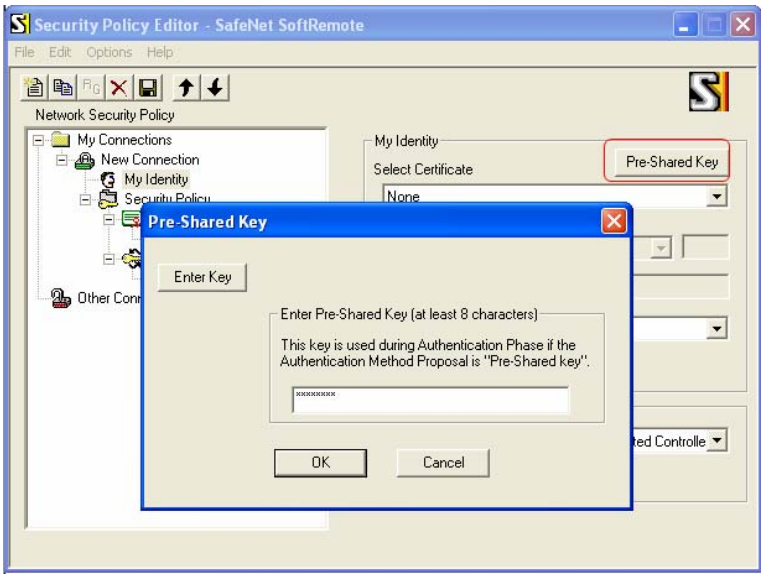
Configure the IPsec VPN connection on your installed client, ensuring that IKE settings are identical to that configured on SifoWorks.

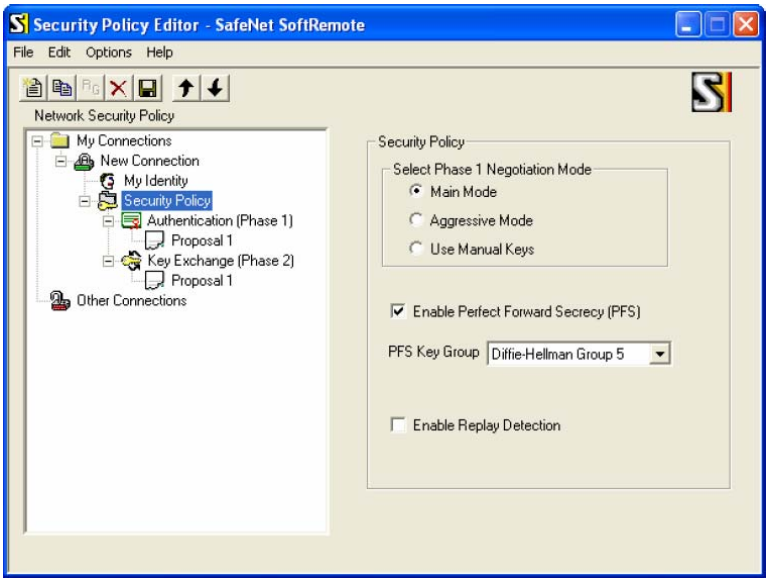
The following shows an example of this configuration via the host, 211.100.10.10, in the WAN domain that uses the client SafeNet SoftRemote.

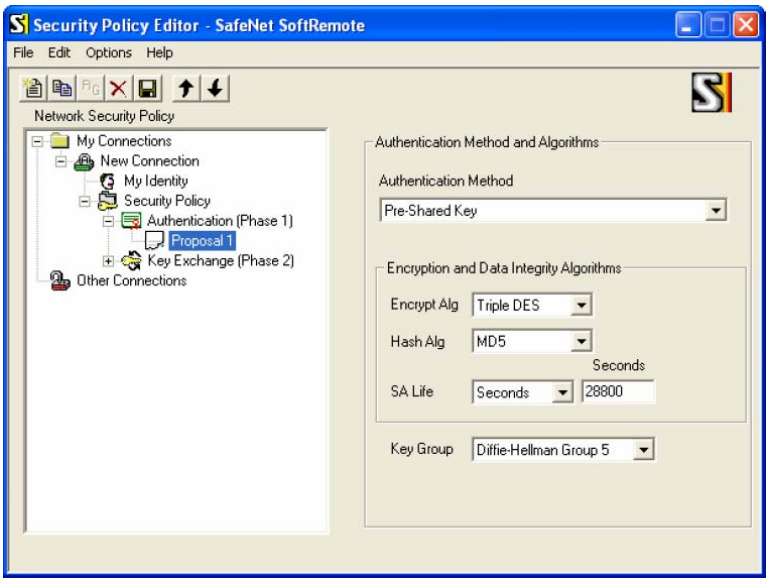


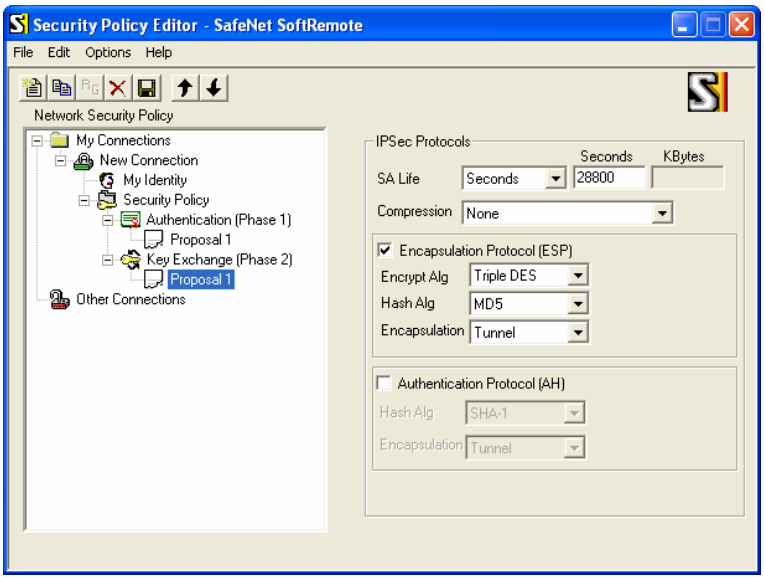
Configure the SafeNet SoftRemote client as follows:






Security Policy Editor - SafeNet SoftRemote
File Edit Options Help
Network Security Policy
My Connections
New Connection
My Identity
Security Policy
Authentication (Phase 1)
Proposal 1
Key Exchange (Phase 2)
Proposal 1
Other Connections
Security Policy
Select Phase 1 Negotiation Mode
Main Mode
Aggressive Mode
Use Manual Keys
Enable Perfect Forward Secrecy (PFS)
PFS Key Group
Diffie-Hellman Group 5
Enable Replay Detection


Security Policy Editor - SafeNet SoftRemote
File Edit Options Help
Network Security Policy
My Connections
New Connection
My Identity
Security Policy
Authentication (Phase 1)
Proposal 1
Key Exchange (Phase 2)
Other Connections
Authentication Method and Algorithms
Authentication Method
Pre-Shared Key
Encryption and Data Integrity Algorithms
Encrypt Alg
Triple DES
Hash Alg
MD5
Seconds
SA Life
Seconds
28800
Key Group
Diffie-Hellman Group 5


Security Policy Editor - SafeNet SoftRemote
File Edit Options Help
Network Security Policy
My Connections
New Connection
My Identity
Security Policy
Authentication (Phase 1)
Proposal 1
Key Exchange (Phase 2)
Proposal 1
Other Connections
IPSec Protocols
Seconds
KBytes
SA Life
Seconds
28800
Compression
None
Encapsulation Protocol (ESP)
Encrypt Alg
Triple DES
Hash Alg
MD5
Encapsulation
Tunnel
Authentication Protocol (AH)
Hash Alg
SHA-1
Encapsulation
Tunnel

Step 3 Activate the IPsec VPN connection

Activate the connection configured in the previous step. If a success message (such as "Successfully connected to My Connections\New Connection") is displayed, the VPN function has been configured correctly.

Otherwise, SifoWorks' IPsec VPN function is not working properly. Please check your IPsec VPN client logs at the remote host or login to SifoWorks to check the related logs generated by the system to locate the problem and modify the configuration accordingly. If the problem persists, please contact O2Security's technical support personnel.

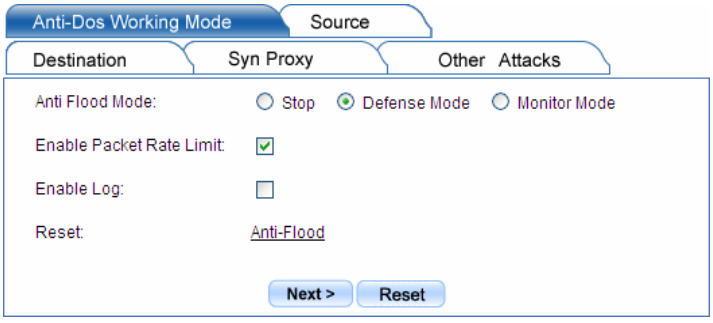
11.7 Phase 5 – Setting up IDS

11.7.1 Configuration Procedure

Follow the steps below to set up SifoWorks' inbuilt IDS function according to the network requirements determined in "11.1 Network Topology and Company Requirements".

Step 1 Configure IDS working mode

1. From the left menu bar, select **"Advance > IDS Setting"**. The interface for the "*Anti-Dos Working Mode*" tab will be displayed.
2. Here, select "Defense Mode" as your device's IDS **Anti Flood Mode** and check the **Enable Packet Rate Limit** checkbox.



3. Click **[Next>]** to move to the "*Source*" tab.

Step 2 Configure the defense settings based on source addresses.

In the "*Source*" tab, keep all default settings for each field and click **[Next>]** to display the "*Destination*" tab.

Step 3 Configure the defense settings based on destination addresses.

In the "*Destination*" tab, keep all default settings for each field and click **[Next>]** to display the "*Syn Proxy*" tab.

Step 4 Configure SYN Proxy mode

In the “Syn Proxy” interface, select the **Never Proxy** option. Click **[Next>]** to move to the interface for the “*Other Attacks*” tab.

Step 5 Set up IDS defense against other types of attacks

In this interface, check the checkboxes corresponding to the **Land Attack** and **ARP Spoof** options.

Step 6 Click **[Save]** to save the IDS configurations.

11.7.2 Testing the Configuration

After SifoWorks has been operating for a period of time in your network, login to the system’s web UI. Select **“Log > Security Log”** from the left menu bar to view IDS related logs.

You can also simulate an IDS attack on the device to check if the IDS function is operating normally.